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THE USE OF TRYPARSAMIDE IN THE TREATMENT OF GENERAL PARALYSIS

RESULTS OF THE FIRST YEAR'S EXPERIENCE *

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PHILADELPHIA

Most syphilographers and clinicians [1] have agreed that a new therapeutic approach is desirable in combating neurosyphilis, since the usual arsenicals and other drugs directed primarily from the spirocheticidal point of view are frequently ineffectual, owing to lack of penetrability of the central nervous system. In this therapeutic dilemma, it was natural that tryparsamide, as developed in the careful studies of Brown and Pearce,[2] should be immediately found of great value in establishing new principles of treatment. Tryparsamide has two remarkable properties: first, it increases the resistance of the individual by improving his general physical status; and, second, the high penetrability for nervous tissue which it possesses may, as stated by Pearce and Brown, increase the potential spirocheticidal action of the drug. Additional studies with tryparsamide by Voegtlin [3] substantiate the results of Brown and Pearce in demonstrating the high penetrability of this drug for nervous tissue as compared to the arsphenamins. It is of interest that recent studies in inoculating general paralytic patients with the tertian malaria organism were of similar therapeutic indication, since increased resistance or increased immunity was produced through the resultant febrile reaction and leukocytosis. These reports [4] from foreign observers are as optimistic as those of Lorenz,[5] Moore and Keidel [6] and others who have used tryparsamide in the treatment of neurosyphilis.

In June, 1923, through the courtesy of Dr. Brown and Dr. Pearce of the Rockefeller Foundation of Medical Research, we began to use tryparsamide. At this time, we were not treating our cases of general paralysis in a routine manner, owing to a lack of success in previous experiences in a large state hospital, in which the usual methods of administering arsphenamin were employed unsuccessfully, including intracistern injections of arsphenaminized serum. The results of our work [7] at that time led to pessimism as to the possibility of arresting the course of general paralysis and to considerable skepticism about later results obtained by workers with tryparsamide.

During the year 1922, 250 patients with general paralysis, fifty-two of whom were women, were admitted to the Philadelphia General Hospital psychopathic wards. In 1923, 218 patients, sixty-seven of whom were women, were admitted. This abundant material often represented failures of treatment in that many of these patients had received the usual antisyphilic treatment in the hands of private physicians or in outpatient clinics. We may for practical purposes divide this large group of material into three main classes: A, the organic group; B, organic reactions with psychoses of functional coloring; C, transitory psychoses without signs of deterioration.

A. *The Organic Group.*—Parenchymatous neurosyphilis in which the destruction of the central nervous system has proceeded beyond repair. These patients showed definite mental deterioration. In our psychopathic wards Group A, unfortunately, predominates. Tryparsamide was employed in a small percentage of these cases to check up on our clinical prognosis as well as to test tryparsamide as a therapeutic agent. Eleven previously committed patients of this type were treated.

B. *Organic Reactions with Psychoses of Functional Coloring.*—General paralysis in which therapy may possibly arrest the pathologic processes and restore the patient for either transient or permanent periods. Clinically, this group includes the psychoses simulating the functional disturbances seen in manic excitements with expansive delusions; in the depressions, and in other reaction types, in addition to the organic syndrome present in general paralysis. Approximately 20 per cent. of the patients admitted came under this heading. The use of tryparsamide in the thirty-six cases of this type treated was of great interest and clinical import, as many of the patients had previously received arsphenamin treatment without success.

C. *Transitory Psychoses Without Signs of Deterioration.*—General paralysis in which the mental symptoms

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* This paper, together with those of Drs. Loyd Thompson and W. I. Lillie, is part of a symposium on the treatment of neurosphyilis. The remaining papers, by Drs. J. E. Moore, H. M. Robinson and R. S. Lyman and by Drs. H. C. Solomon and H. R. Viets, together with the discussion, will appear next week.

1. Solomon, H. C.: Treatment of Neurosyphilis, J. A. M. A. **81**: 1742 (Nov. 24) 1923.

2. Pearce, Louise: Studies on the Treatment of Human Trypanosomiasis with Tryparsamide, J. Exper. Med. (Supplement) **34**: 1 (Dec. 1) 1921. Brown, W. H., and Pearce, Louise: Tryparsamide; Its Actions and Use, J. A. M. A. **82**: 5 (Jan. 5) 1924.

3. Voegtlin, Carl; Smith, M. I.; Dyer, H., and Thompson, J. W.: Penetration of Arsenic Into the Cerebrospinal Fluid, with Particular Reference to Treatment of Protozoal Infections of the Central Nervous System, Pub. Health Rep. **38**: 1003 (May 11) 1923.

4. Wagner-Jauregg: The Treatment of General Paresis by Inoculation of Malaria, J. Nerv. & Ment. Dis. **55**: 369 (May) 1922. Delgado, H. F.: Treatment of General Paresis by Inoculation of Malaria, J. Nerv. & Ment. Dis. **55**: 376 (May) 1922.

5. Lorenz, W. F.; Loevenhart, A. S.; Bleckwenn, W. J., and Hodges, F. J.: Therapeutic Use of Tryparsamide in the Treatment of Neurosyphilis, J. A. M. A. **80**: 1497 (May 26) 1923.

6. Moore, J. E.; Robinson, H. M., and Keidel, A.: Tryparsamide in the Treatment of Syphilis, J. A. M. A. **82**: 528 (Feb. 16) 1924.

7. Ebaugh, F. G.: The Treatment of General Paresis by the Intracistern Route, Arch. Neurol. & Psychiat. **7**: 325-331 (March) 1922.

are frequently transitory and are exhibited before any signs of deterioration develop. In this group occur the delirious reactions and neurologically irritative phenomena, as seen in convulsive seizures, aphasic attacks and meningovascular and endarteritic upsets. Such patients are so few that their admission to the psychopathic ward was a rare occurrence. However, a small number of patients were admitted showing delirious reactions. Five cases were chosen for treatment.

quent progress notes regarding clinical and serologic changes following treatment.

Although mercuric salicylate was given in the first ten cases, this was discontinued owing to complaints from the patient concerning the pain of injection. At any rate, for the purposes of the investigation, it seemed advisable not to use both drugs in treatment in order that definite data could be obtained concerning the value of tryparsamide.

TABLE 1.—*Clinical and Serologic Summary of Ward Patients Treated* *

					Serologic Findings in Beginning			
Name	Age	Sex†	Color	Clinical Grouping	Cell Count	Colloidal Gold Curve	Serologic Findings, June, 1924	Present Condition
1. O. A.	35	♂	W.	B. Expansive	21	5555554440	Gold: 5555555000; cells, not made	Treatment continued; neurorelapse
2. E. A.	42	♂	W.	B. Depressed	6	5555554300	Gold: 5555555221; cells 6	Working irregularly
3. A. B.	31	♀	W.	B. Manic	29	5555554300	Gold: not made; cells 5	Improved; working
4. C. B.	29	♀	C.	B. Depressed	11	4444211000	Gold: 1122110000; blood negative	No improvement noted
5. M. B.	34	♂	W.	B. Expansive	50	5555542100	Gold: not made; cells 0	No improvement; did not return to clinic
6. M. B.	38	♂	W.	A. Deteriorated	28	5555554220	Gold: 5555554000; cells 4	Deterioration
7. J. B.	40	♂	W.	A. Deteriorated	56	5555555553	Gold: 5555553300; cells 4	Unimproved
8. J. B.	38	♂	W.	B. Expansive	11	4444443111	Gold: 2333423000; cells 5	No improvement
9. S. C.	25	♀	C.	C. Delirious reaction	22 Blood neg.	5555554432	Gold: 5555551000; cells 1	Marked improvement; working regularly
10. C. C.	30	♂	W.	B. Depressed	8	5555542211	Gold: not made; cells, not made	Developed severe jaundice
11. J. C.	35	♂	W.	A. Deteriorated	24	5555552211	Gold: 4443220000; cells 0	Unimproved; developed mild jaundice
12. W. C.	39	♂	W.	A. Deteriorated	35	5555554433	Gold: 5555553300; cells 4	Unimproved
13. F. C.	25	♀	W.	C. Delirious reaction	0	5555554310	Gold: 5555555421; cells 5	Improved; working
14. R. C.	32	♂	W.	A. Deteriorated	32	5555552200	Gold: 4444443000; cells 0	Unimproved
15. V. DN.	42	♂	W.	B. Manic reaction	18	5555552000	Gold: 5554310000; cells 3	No change
16. F. D.	40	♂	W.	A. Deteriorated	1	4444421000	Gold: 5444432100; cells 0	Unimproved
17. H. D.	52	♂	W.	B. Manic reaction (weak)	79	5555555443	Gold: not made	Died; bronchopneumonia
18. H. F.	43	♂	W.	B. paranoid	0	5555555453	Gold: 4555554100; cells 1	Unimproved; deported
19. H. F.	13	♀	W.	A. Juvenile	9	5555553332	Gold: 5555553000; cells 0	Unimproved
20. W. F.	60	♂	W.	B. Depressed	63	4444110000	Gold: 2233321000; cells 0	Working regularly
21. J. F.	12	♀	C.	B. Juvenile	310	5555554421	Gold: 4445431000; cells 0	Tremors less
22. A. F.	44	♂	W.	B. Depressive reaction	45	5555531100	Gold: 3444333110; cells 15	Treatment continued; improving
23. P. G.	46	♂	W.	B. Depressive reaction with cardiovascular neurosyphilis	60	4555554111	Gold: 2555552340; cells 8	No change
24. A. G.	46	♂	W.	B. Hypochondriacal	5	5555554330	Gold: not made	Unimproved
25. J. H.	48	♂	C.	B. Depressive reaction	2	5544432100	Gold: not made	Working regularly
26. W. H.	59	♂	W.	B. Expansive	62	5555552200	Gold: not made	Died
27. D. K.	39	♂	W.	B. Depressed	10	5555541100	Gold: 2243332000; cells 0	Unimproved
28. W. K.	38	♂	W.	B. Expansive	6	5555553543	Gold: 5555432100; cells 2	Working regularly
29. J. L.	36	♂	W.	B. Manic	77	4443322000	Gold: 2222223000; cells 9	Working regularly
30. M. L.	46	♀	W.	B. Manic reaction	150	4222220000	Gold: not made; cells 0	Unimproved; committed
31. W. L.	35	♂	W.	C. Delirous reaction with aphasia	20	5555542100	Gold: 5555410000; cells 3	Working regularly, averaging $30 a week
32. T. Mc.	35	♂	W.	B. Depressed	58	5555555221	Gold: 5555555554; cells 194	Neurorelapse
33. H. M.	32	♂	W.	B. Expansive	115	5555543300	Gold: refused puncture	Working regularly
34. A. M.	42	♂	W.	A. Deteriorated	10	5555555544	Gold: 5555553300; cells 0	Deterioration
35. E. O'B.	32	♂	W.	B. Taboparalysis expansive	20	5555552211	Gold: 5555553100; cells 3	Improving
36. E. O'B.	21	♂	W.	C. Depressive reaction	55	5555543000	Gold: 4455321000; cells 0	Working regularly
37. F. R.	28	♀	C.	B. Manic reaction	87	5555555400	Gold: 5555300000; cells 0	Unimproved
38. J. R.	38	♂	W.	B. Depressive reaction	19	5555554340	Gold: 5555551000; cells 5	No change
39. G. R.	39	♂	W.	B. Expansive	11	5555554430	Gold: 5555552210; cells 8	Unimproved; beginning of optic atrophy
40. J. S.	47	♂	W.	A. Committed	60	5555531000	Gold: not made; cells 0	Unimproved
41. M. S.	38	♀	W.	B. Expansive	0	5555555544	Gold: 5555554221; cells 1	Discharged for rest period; improved
42. A. S.	50	♂	W.	B. Expansive	28	5555555322	Gold: 5555553300; cells 4	No change
43. J. S.	47	♂	W.	B. Depressed	79	5555544110	Gold: 5555000000; cells 0	No improvement
44. C. S.	39	♂	C.	B. Depressed	50	5555555410	Gold: 5555330000; cells 1	Discharged; did not report to clinic
45. R. S.	40	♀	W.	B. Depressed	1	5555555554	Gold: 4445443000; cells 3	Discharged; working regularly
46. S. S.	51	♂	W.	B. Expansive	25	5555554300	Gold: 4455421000; cells 0	Improved; working
47. R. V. H.	35	♂	W.	C. Delirious reaction	3	5555432100	Gold: 5555300000; cells 0	Improved; working regularly, $25 a week
48. C. W.	57	♂	C.	A. Deteriorated	129	5555555410	Gold: 4443211000; cells 1	Died; terminal pneumonia
49. A. W.	34	♀	W.	B. Agitated	20	5554442211	Gold: 2333331000; cells 2	Improved; working regularly; blood neg.
50. W. W.	41	♂	W.	B. Agitated	45	5555554210	Gold: 5555432000; cells 0	No change
51. J. W.	48	♂	W.	B. Manic reaction	10 Blood neg.	5555542100	Gold: 5555300000; cells 5	Working regularly
52. F. Y.	48	♀	W.	A. Deteriorated	10	5555554210	Gold: bloody fluid	No change

* Unless noted, the blood and spinal fluid remain positive.
† In this column, ♂ indicates male; ♀, female.

TECHNIC OF TREATMENT

Tryparsamide was given intravenously in weekly doses of 3 gm. (in a solution of 10 c.c. sterile distilled water) over a period of ten weeks. A rest period of eight weeks was instituted after each course of ten injections. Careful preliminary ophthalmologic studies were made in each case, and optic atrophy of any degree was ruled out. Routine laboratory studies, including blood chemistry and urine, were normal in each case. A weight chart was kept on each patient, as well as frequent progress notes regarding clinical and serologic changes following treatment.

CLINICAL AND SEROLOGIC FINDINGS FOLLOWING TRYPARSAMIDE TREATMENT

The clinical results of tryparsamide are summarized in Table 1, and brief abstracts of the main facts in several cases are given. We define improvement in this group to mean that the patients have been discharged from the psychopathic wards and are working regularly and suporting themselves or their families. Included in our statistics are all the ward patients treated, including the eleven deteriorated cases in which no benefit was

expected. Fifteen have definitely improved according to the foregoing standards. Summarized in terms of our clinical, diagnostic and prognostic classification, the cases in which improvement was made are distributed as shown in Table 2.

As treatment continued, the ward patients showing definite improvement were discharged to the outpatient clinic following the organizing of a tryparsamide treatment day, when they continue to report at regular intervals.[8] Only two patients have failed to report since being discharged from the ward. Many other patients with general paralysis also were treated in this outpatient clinic when their condition was not severe enough to justify admission to the wards. They are therefore not included in this study, nor are the tabetic patients treated in other departments. The following cases are of interest as illustrating the typical findings and the course in the hospital of cases of the clinic grouping B.

TABLE 2.—*Summary of Cases*

General Paralysis		Number Treated	Number Improved
Group A	Deteriorated cases	11	0
Group B	Organic psychoses with functional coloring	36	10
Group C	Transitory psychoses	5	5
Total		52	15

REPORT OF CASES

CASE 28.—W. K., a man, aged 38, a patrolman, admitted to the hospital June 2, and discharged, Aug. 8, 1923, had been very forgetful and irritable during the preceding year. He was sent to the hospital on account of memory defects and a recent tendency to become expansive. He said he was "the best man on the whole police force." On admission, he showed typical speech and writing defects, and tremors of the face. The pupils were unequal, irregular and fixed to light. Mentally, he showed a tendency to expansion, marked memory discrepancies and judgment defects. Serologic examination showed the blood and fluid to be four plus; there were 48 cells; there was a heavy trace of globulin. The colloidal gold curve was 5555555543.

The patient is now receiving his fourth course of tryparsamide weekly, and his associates and family notice no abnormality. His mental condition is normal; his speech is normal, and his writing is improved. There are no facial tremors. The weight curve, according to the accompanying chart, is fairly typical of the cases treated.

CASE 45.—R. S., a woman, aged 40, admitted to the hospital, Sept. 1, 1923, and discharged to the outpatient clinic, October 30, had a typical case of general paralysis with depressive reaction of two months' duration. She had undergone a change in general character during the preceding year. At times she was agitated, restless, confused and very forgetful. The pupils were irregular and reacted to light. A facial tremor was present. Speech and writing defects were present. The reflexes were normal. The spinal fluid was positive in both antigens. The blood was negative in both antigens. There was an increase in globulin. The colloidal gold curve was 5555555554.

The patient is now receiving her third course of tryparsamide. She performs her full household duties, and her husband notices nothing abnormal in her general behavior. The sensorium is clear. The latest serologic reports showed the spinal fluid positive in cholesterin antigen, and negative in Noguchi antigen. The colloidal gold curve was 4455442000; there were 3 cells; there was a faint trace of globulin.

CASE 30.—M. L., a woman, aged 40, had a typical manic reaction. The patient was overactive and overproductive, violent and destructive. There were the typical neurologic findings of general paralysis. She showed no improvement during seven months of treatment and was therefore committed after completing her second course of tryparsamide. She showed no gain in weight.

The following cases are of interest in illustrating the transitory psychotic group (C) along with a control case treated only with arsphenamin:

CASE 13.—F. C., a woman, aged 25, admitted to the hospital, Feb. 2, 1923, had a delirious reaction. This patient showed emotional instability with hallucinatory periods. She was completely disoriented, with a general loss of mental capacity and ability. The pupils were irregular and unequal, the right being larger than the left; they were fixed to light. There was a slight overflow facial tremor on emotional stimuli. The reflexes were overactive and equal. The Wassermann reaction was four plus; there were 79 cells present; there was a heavy trace of globulin. The colloidal gold curve was 5555555430.

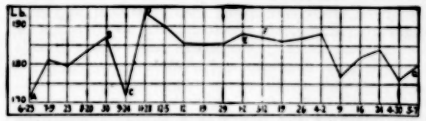
The patient was discharged, March 22, for arsphenamin treatment, and received twelve injections of neo-arsphenamin of 0.9 gm. each with an extreme reaction following the injections. She had headaches, nausea and vomiting, and at times she was incapacitated for her work for several days. She was therefore transferred from the arsphenamin clinic to the tryparsamide clinic. She is now completing her second series of tryparsamide, and has never had any reactions to this drug. The patient has been working regularly in a department store as a clerk, earning $14 a week. At times she is overemotional. The sensorium is clear, and by all her associates she is considered normal.

At present the colloidal gold curve is 5555555421; there are 5 cells. The spinal fluid Wassermann reaction remains positive.

CASE 31.—W. L., a man, aged 35, was admitted to the hospital, Jan. 1, 1923, following a convulsive seizure with motor aphasia. He was treated with arsphenamin and discharged from the ward prematurely, February 25, to continue treatments with arsphenamin in the outpatient clinic. Here he received weekly injections of arsphenamin. He was unable to work. He had a return of his convulsions, and was irritable, antagonistic and abusive at home. He lost sexual power entirely.

He was readmitted to the ward, June 20, when he was placed on tryparsamide. He showed marked improvement following the first course of tryparsamide. He was discharged to the outpatient clinic, August 22. Since that time, he has been reporting regularly to the clinic. There has been a decided improvement in his general mental condition. He has been working regularly as an insurance agent during the last nine months, and has been averaging an income of $30 a week.

At present, the examination shows that the pupils react to light and in accommodation; there is a slight tremor of the face; there is speech defect. The writing defects are less marked. He is now entering his fourth course of treatment.



Weight in Case 28 during three series of treatments with tryparsamide: *A*, beginning of first series; *B*, end of first series; *C*, during rest period; *D*, beginning of second series; *E*, end of second series; *F*, beginning of third series; *G*, end of third series.

The serologic examination on admission revealed: blood Wassermann reaction, positive; spinal fluid, positive; 20 cells present. A heavy trace of globulin; colloidal gold curve, 5555542100.

At present, the blood and spinal fluid are four plus in both antigens. There are 3 cells. There is a heavy trace of globulin. The colloidal gold curve is 5555410000.

This case is a very interesting one, as well as Case 13, since both patients derived very little benefit from arsphenamin. One patient showed a marked reaction incapacitating her for work, and the latter patient's

8. Ebaugh, F. G., and Dickson, R. W.: Summary of Experiences with Tryparsamide Since June, 1923, Tr. Philadelphia Psychiat. Soc., March 15, 1924.

mental condition made it necessary for him to be readmitted to the ward. Both patients have shown no reaction to tryparsamide, and continue to report to the clinic at regular intervals.

CASE 9.—S. C., a woman, aged 25, admitted to the hospital, Oct. 10, 1923, and discharged, Jan. 30, 1924, three months previous to admission, had a convulsive seizure, immediately followed by a delirious reaction. On admission, the pupils reacted to light and in accommodation. The reflexes everywhere were overactive and equal. There was tremor of the face, and there were extended fingers. The spinal fluid and the blood were four plus in both antigens. There were 22 cells present. There was a heavy trace of globulin. The colloidal gold curve was 5555555432.

The patient is now completing her second course of tryparsamide. She is doing her household duties, working as a maid. The social service agency reports that her employer notices no abnormalities in her. The latest serologic reports are: colloidal gold curve, 5555441000; spinal fluid, four plus; 1 cell; a heavy trace of globulin.

J. L., a man, aged 25, admitted in a similar mental condition and with a history of convulsions, showed the findings of a typical case of general paralysis both clinically and serologically. There was a history of occasional convulsive attacks during the year previous to admission. Neurologically, the patient showed fixed, irregular pupils; there were facial tremors; left ptosis, and overactive and unequal reflexes, greater on the left side. The Babinski reflex was present on the left side.

TABLE 3.—*Jaundice in Case 10* *

	15 Minutes	One Hour	Two Hours
4/19/24	8%	10%	8%
4/26/24	13%	11%	11%
5/11/24	5%	7%	9%
Widal Hemolastic			
4/17/24	7250 6850 7500		
Urobilin, positive			
Vanden Bergh, indirect			
4/22/24	8675 9050 9950		

* Determined by Rosenthal's liver function test, made by Dr. H. L. Bachus.

The patient was treated as a control case with neo-arsphenamin, 0.9 gm. given at weekly intervals. His condition gradually grew worse; the convulsions continued, and mentally he showed evidence of advanced deterioration, making immediate commitment justifiable.

Clinically, the tendency of the patients to be expansive during treatment was very marked. In the ward, they talked freely concerning their treatment, and gave exaggerated statements concerning the improvement of their physical states. One patient referred his friends to the clinic for diagnosis and treatment.

The serologic results were interesting in that in all cases the cell count and the globulin fell within normal limits following the first course of injections. The gold curve tended to show less precipitation. The spinal fluid Wassermann reaction, however, remained unaltered in nearly every case. The blood Wassermann reaction changed as noted in Table 1 in one case (Case 4). The tendency toward fixity of the spinal fluid Wassermann reaction in Case 8 led us to treat three patients by means of intraspinal and, later, intracistern injections of tryparsamidized serum, prepared according to the Swift-Ellis technic. These cases, however, showed little change, although two patients have received ten such injections; the spinal fluid remained positive in each case. We plan to continue with intracistern injections in a large number of cases, in hopes of bringing about a more rapid change in the spinal Wassermann reaction.

We were agreeably surprised in the marked improvement in the physical condition of the entire group of patients treated. In two thirds of these cases, this consisted in a definite gain in weight, and an increased hematopoiesis as shown in increased hemoglobin and red blood cell counts. The accompanying chart of the weight of Case 28 is fairly characteristic.

UNTOWARD EFFECTS OF TRYPARSAMIDE

In the treatment of these patients, approximately 1,000 intravenous injections have been made, and the unfavorable results summarized as follows:

1. Jaundice developing after injections in two cases.
2. Dermatitis in one case.
3. Visual disturbances.
4. The serious question of neurorelapse.

The jaundice in the two cases occurred during the second course of injections. In Case 11 it was mild, and, after two weeks' rest, treatment was again instituted with no bad results. In Case 10, however, it was very severe, with definite evidence of impairment of liver function as shown in the reports given in Table 3.

The dermatitis, in contrast to that seen after arsphenamin therapy, was certainly mild, and the patient has now completed a course of tryparsamide with no return of her skin condition. We feel that this finding is therefore of little clinical import.

Since tryparsamide has a selective affect for the optic tract and can never be used with any degree of optic atrophy, its universal use in general paralysis has been seriously impaired. To our surprise, routine ophthalmologic consultations have ruled out the therapeutic use of this drug in nearly one third of the cases selected for treatment. This was discouraging, since these patients frequently were considered otherwise favorable for treatment after complete clinical and serologic examinations. One case, in which the eyegrounds were reported normal at the beginning of treatment, after one course, developed definite visual difficulties, and, on later examinations, showed a beginning optic atrophy which, we fear, may be progressive. Several patients have told us of transient visual difficulties, complaining subjectively of blurring and seeing flashes of light. Treatment, however, was not discontinued, except in the case described showing optic atrophy. Permanent amblyopia has not occurred.

However, the question of neurorelapse impresses us as being of extreme importance, and this paper would be of even greater optimism if two recent reactions following treatment had not been noted. Since they are both similar, the main facts of only one case need be discussed.

CASE 1.—O. A., a man, aged 33, admitted to the hospital, March 7, 1924, following the second injection of tryparsamide, became delirious. He lost progressively in weight, and developed signs of meningeal irritation, rigidity of the neck, and a bilateral Kernig sign. He was incontinent of urine and feces; bed sores developed, and his condition was considered critical for several weeks. As this reaction began to wear off, he was again placed on tryparsamide, and, at the present time, has completed his first course. His weight is now slowly returning to normal, and the meningeal signs have disappeared entirely. During this flare-up, it is interesting to note that the general paralytic gold curve was longer than that present at the beginning of the treatment, with an increase in cell count.

The second patient is also apparently improving, and both are now returning to their previous physical and

mental condition with a rapidity that promises well for later improvement.

The question of neurorelapse was also of interest in our deteriorated group. Patient 14 was observed steadily to become worse both mentally and physically, with an increase in the pleocytosis of the spinal fluid. During a course of injections, he lost considerably in weight, developed marked agitation and became violent and abusive. Extreme memory discrepancies became more marked. In the rest period, he returned to his former condition, and after three courses apparently shows a gain over his condition at the onset of the treatment. As in the use of other drugs, continued treatment may overcome this sudden neurorelapse. We have not encountered any really serious results of these reactions, although all types of severe cases of general paralysis have been treated. The two cases noted, however, cause us some anxiety.

COMMENT

One cannot help but be encouraged by the results obtained with the use of tryparsamide in the treatment of general paralysis. The fact that out of the fifty-two patients treated, fifteen are now working is most gratifying, especially as eleven of the fifty-two cases were deteriorated. During the year 1922, only five patients were discharged from the wards in good condition.

In comparison with the arsphenamins, tryparsamide has impressed us favorably, particularly in the comparative absence of reactions following administration. The arsphenamins, in our experience, frequently either alone or with spinal drainage may give negative serologic results without clinical improvement; whereas, tryparsamide frequently gives good clinical results, although the serologic changes are meager and transitory. Increased resistance or increased immunity of patients treated with tryparsamide is well shown in the improvement in general physical status and increased hematopoiesis.

The main contraindication for tryparsamide is brought up in the question of eyeground changes. One of our patients has definitely developed optic atrophy following the first course of tryparsamide. Further clinical data and neuro-ophthalmologic studies are needed. Data concerning the frequency of remissions are of equal import.

The question of neurorelapse impresses us as being a very important one, and we certainly do not wish to duplicate our recent experiences with two of the patients treated. However, as in arsphenamin therapy, the patients in whom these upsets occurred responded to further treatment. The frequency of reactions of this type in the further use of tryparsamide will prove of extreme clinical importance. One should not speak of a cure in neurosyphilis, and therapy is directed to arrest this disease before mental deterioration has developed.

Definite conclusions concerning these cases that have improved can only be given after a five-year interval. In the meantime, clinical, therapeutic and psychiatric studies must be made as well as critical control data obtained concerning the use of other drugs and methods. At present, we can definitely conclude that tryparsamide gives evidence of being the best drug so far advanced in the treatment of general paralysis. We do not feel that a general release of this drug should be made now, since many physicians would begin to use it in primary and secondary types of syphilis, in which it would prove to be valueless.

Thirty-Fourth and Pine streets.

NEUROSYPHILIS SIX OR MORE YEARS AFTER TREATMENT *

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The advent of the Swift-Ellis [1] technic of intraspinal therapy in 1912 served as a stimulus to the interest in neurosyphilis, and since that time a great many cases have been treated by this method and its various modifications. While the reports of the immediate effects of such treatment are numerous, few references can be found in which the late results of intraspinal therapy in neurosyphilis are recorded. It would seem, therefore, that an endeavor to check up these results would be of value.

The cases that form the basis of this report consist of clinic and private patients as well as a number of cases at the Army and Navy General Hospital, and were seen between Sept. 1, 1914, when I first began practice in Hot Springs, and July 1, 1917, when I left Hot Springs for army service. During this time, eighty-four patients with neurosyphilis were observed and given intraspinal therapy. Some of them were seen more than once; that is they returned to Hot Springs for treatment on one or more occasions subsequent to their original visit to me.

As the check up on these patients was begun in August, 1923, it will be seen that at least six years must have elapsed since the original visit of any of them, and in some instances as long a period as nine years. As none of these patients were residents of Hot Springs, it was exceedingly difficult, and in some instances impossible, to learn the late results of the treatment they had received. In fact, of the eighty-four cases treated, it was possible to determine the present status of but fifty-three. And while many of the remaining thirty-one cases were exceedingly interesting, this report will deal only with fifty-three cases. I recognize that this is a comparatively small number from which to draw any very definite conclusions, but the findings are recorded for what they are worth. Of the fifty-three cases, only three were seen personally since August, 1923, so it is apparent that the present status as recorded was obtained largely through letters from the relatives of the patients. The information regarding some of the cases was obtained from the patients themselves, and, in a few instances, from other physicians.

The types of neurosyphilis of the fifty-three patients were: arteritis, three; meningitis, nine; tabes, twenty-three; general paralysis, eleven; taboparalysis, four; gumma of brain, two; gumma of spinal cord, one.

The treatment of all these cases was quite intensive, and consisted of from one to twenty-five intraspinal injections, from six to sixty intravenous injections of arsphenamin, and one or more courses of mercury, usually by intramuscular injection. The latter was quite variable, some patients receiving less than a dozen such injections, and some as many as a hundred or more. The intraspinal injections were for the most part made according to the Ogilvie [2] method; some were made by the Swift-Ellis [1] method; a few by Wile's [3] method of injecting arsphenamin directly into the spinal canal after diluting with the aspirated spinal fluid, and a few by

* Read before the Section on Nervous and Mental Diseases at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Swift and Ellis: New York M. J. **38**: 1446, 1912.
2. Ogilvie, H. S.: The Intraspinal Treatment of Syphilis of the Central Nervous System with Salvarsanized Serum of Standard Strength, J. A. M. A. **63**: 1936 (Nov. 29) 1914.
3. Wile: J. Lab. & Clin. Med. **1**: 119, 1915.

Byrnes'[4] method of intraspinal injection of mercurialized serum.

Those patients who received the large number of treatments were seen on several occasions; that is, their treatment was divided into several courses, from three months to a year apart. In most of the cases, not all of the treatment was given by me, but was partly given by the patients' home physicians after their visit to Hot Springs. Table 1 shows the present status of the fifty-three patients.

TABLE 1.—*Present Status of the Fifty-Three Patients*

	Clinically and Serologically Well	Clinically Well	Progressive	Dead from Neurosyphilis	Dead from Cause Other than Neurosyphilis
Arteritis	1	0	0	1	1
Meningitis	6	1	0	0	2
Tabes	1	2	8	8	4
General paralysis	0	0	1	8	2
Taboparalysis	0	0	0	4	0
Gumma of brain	0	0	0	1	1
Gumma of spinal cord	0	0	0	0	1
Total	8	3	9	22	11

It will be noted that, of the fifty-three patients, only twenty are still living, eight being clinically and serologically well, and three clinically well. Of the other nine living patients, eight persons with tabes and one with general paralysis are reported to be "no better," "worse," etc. Of the thirty-three who are dead, it will be observed that twenty-two patients died of neurosyphilis and eleven of other causes. Three of the latter were suicides, and, in the case of another patient, the cause of death could not be determined. The one patient with arteritis who is still living was first seen in April, 1917, at which time he had a complete hemiplegia and aphasia of three days' standing. He gave a history of chancre of the finger two years previously, which had been followed by a slight rash. He had received six intravenous injections of arsphenamin and thirty inunctions of mercury during the following six weeks, but no antisyphilitic treatment since. The onset of the hemiplegia had been quite sudden, with giddiness, nausea and stupor. As his blood Wassermann reaction was strongly positive, it was decided to start antisyphilitic treatment at once. During the following two months, he was given eight intravenous and six intraspinal injections of arsphenamin, as well as forty-eight intramuscular injections of mercuric benzoate. During this time, the aphasia cleared up completely, and the hemiplegia improved so much that the patient was able to walk quite well with a cane. His spinal fluid, which in the beginning of his treatment had shown thirty-four lymphocytes per cubic millimeter and a strongly positive Wassermann reaction, now showed only six lymphocytes and a weakly positive Wassermann reaction, with 1 c.c.

I did not see this patient again until November, 1920, but during this interval he had received four courses of treatment similar to the one I had given him. At this time he was both clinically and serologically well, with the exception of a slight limp, a sluggishness of the pupils and an increase in the knee jerks. In spite of these findings, I advised further treatment, and administered seven intravenous arsphenamin injections and thirty-six intramuscular injections of mercuric benzoate. I saw him again in December, 1922, at which time his findings were practically the same as they had been in 1920, and I advised no further treatment at that time. In August, 1923, he wrote me that his condition had remained the same. This patient I consider clinically and serologically well.

All six patients with meningitis who are regarded as clinically and serologically well were seen in the early course of the disease; that is, during the first year following the chancre. The greatest number of intraspinal treatments received by any of these patients was twelve, and the smallest, one. However, they have all received several courses of intravenous and intramuscular therapy. Table 2 shows the treatment of these patients and the findings in the spinal fluid taken since August, 1923.

The patient with tabes who is clinically and serologically well is interesting from the fact that during his first visit to Hot Springs in December, 1914, he refused intraspinal therapy, and even a spinal puncture for diagnostic purposes. Furthermore, he received only three intravenous injections of arsphenamin and thirty mercury inunctions. At this time, a tentative diagnosis of tabes was made on the history of a chancre eight years previously, with only a few mercury inunctions and potassium iodid by mouth as treatment, presumably mild gastric crises, diminished knee jerks, and a positive blood Wassermann. This patient returned to Hot Springs in March, 1915, with the gastric crises increased and this time submitted to intraspinal therapy. He was given eight such injections and a like number of intravenous arsphenamin injections. He insisted, however, on taking mercury inunctions instead of intramuscular injections.

The gastric crises were completely stopped by this treatment, and the spinal fluid became negative. I have not seen this patient since, but he has received several courses of intraspinal and intravenous therapy, and in December, 1923, wrote me that he was well and his spinal fluid was negative.

Of the three cases in which the patients are recorded as clinically well, the patient with meningitis was first seen in September, 1916. He was given eight intraspinal treatments and a like number of intravenous arsphenamin injections, with forty-two intramuscular injections of mercuric benzoate. Similar courses of treatment were given by his home physician in 1918, 1919 and 1920. He had no more treatment until March, 1924, when he again consulted me. At this time, he had no subjective symptoms, but his pupils were irregular in outline, and did not react to light and in accommodation. His spinal fluid showed a moderately positive Wassermann reaction, with 1 c.c., a cell count of 21, and a colloidal gold curve of 4322210000. He was given six intraspinal injections, a like number of intravenous arsphenamin injections, and thirty intramuscular injec-

TABLE 2.—*Treatment of Six Meningitis Patients*

	Intraspinal Injections	Intravenous Injections	Intramuscular Injections	Present Spinal Fluid Findings
Case 1	6	34	Several courses	Negative
Case 2	4	22	Several courses	Negative
Case 3	1	48	Several courses	Negative
Case 4	11	32	Several courses	Negative
Case 5	12	Many, total unknown	Several courses	Negative
Case 6	3	12	Several courses	Negative

4. Byrnes, C. M.: The Intradural Administration of Mercurialized Serum in the Treatment of Cerebrospinal Syphilis, J. A. M. A. 63:2182 (Dec. 19) 1914.

tions of mercuric chlorid, which had only a slight influence on the spinal fluid.

Neither one of the two patients with tabes who are recorded as clinically well had advanced very far in his disease when first seen, and they received quite similar courses of treatment, namely, about twenty intraspinal and thirty intravenous arsphenamin injections, and a great deal of mercury, both by injection and by inunction. Neither patient has been seen since his original visit, but each reports that he is feeling fine, although neither has had the spinal fluid examined recently.

Of the eight cases of tabes recorded as progressive, only one was seen more than once. This patient was examined in June, 1916, and given six intraspinal injections of mercurialized serum and thirty-two intramuscular injections of mercuric benzoate. I saw him again in the fall of 1918 in his home town in consultation with his home physician, at which time I advised further intraspinal therapy. Accordingly, his physician administered eight Swift-Ellis treatments. This was repeated in 1919 and in 1920. He again consulted me in Hot Springs in January, 1922. At this time he had a typical tabetic gait, although he walked without assistance. As he could remain in Hot Springs only a short time, I was able to give him but three intraspinal and five intravenous treatments. In December, 1923, his home physician wrote me that he had refused further intraspinal therapy and was gradually getting worse.

All the remaining seven patients have had some intraspinal therapy since being treated in that manner by me, but the reports from all of them have been most discouraging, two of them being unable to walk at all.

The one living patient with general paralysis is interesting in that he has received no antisyphilitic therapy since I gave him ten Swift-Ellis treatments in the fall of 1915. At this time, he improved mentally and serologically, and returned to his home, where he was able to resume some of his work as an orchardist. He continued with this work until the fall of 1920. It was not until the spring of 1922, however, that it was deemed advisable to place him in an institution. This was done, and a letter from the superintendent late in 1923 states that, while no antisyphilitic treatment had been administered, the patient remained practically the same both clinically and serologically. Spinal drainage was performed on three occasions, the spinal fluid being entirely negative, with the exception of a slight increase in the number of lymphocytes, twelve being the maximum.

Of the thirty-three patients who are now dead, it is not necessary to consider the eleven who died from causes other than neurosyphilis.

The one patient with arteritis died of cerebral hemorrhage three months after receiving five intraspinal and six intravenous arsphenamin injections, and about twenty-five intramuscular injections of mercuric benzoate.

Of the eight patients with tabes who are dead, only two received treatment which is comparable with that received by those who are living. However, these two patients were seen after the disease had progressed to the cane stage.

Seven of the twelve patients with general paralysis and taboparalysis who are dead had three or more courses of from six to eight intraspinal and intravenous arsphenamin injections, in addition to a great deal of mercury, but, in spite of this treatment, the disease, while apparently arrested at times, progressed to a fatal termination.

The patient with gumma of the brain died, according to his widow, during a convulsion two months after I had given him four intraspinal and eight intravenous injections of arsphenamin.

COMMENT

Eighty-four cases of neurosyphilis were treated by intraspinal as well as by other methods between Sept. 1, 1914, and July 1, 1917. Of the eight-four cases, the present status of but fifty-three could be determined, and of these patients but twenty are living and thirty-three are dead.

The best results were apparently obtained in the cases of meningitis, while the poorest results were obtained in the cases of general paralysis and taboparalysis.

The tabes patients who received the greatest amount of treatment, and who were seen fairly early in the course of the disease, responded quite encouragingly.

CONCLUSIONS

1. Intraspinal therapy is of value in neurosyphilis.
2. It should be given in connection with intravenous arsphenamin injections and mercury.
3. It should be given at periodic intervals as long as the patient remains clinically or serologically positive.

TRYPARSAMIDE TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM

OBSERVATIONS FROM AN OPHTHALMOLOGIC STANDPOINT *

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A detailed, ophthalmologic study of the different types of syphilis of the central nervous system has been made in order to ascertain the ocular effects from tryparsamide treatment. The observations were instigated by the report of Pearce [1] that the only "untoward effects" of tryparsamide in the treatment of trypanosomiasis in human beings were ocular.

In order more readily to compare the ocular changes in untreated and treated syphilis, the cases were divided as follows: (1) ocular changes in untreated syphilis; (2) ocular changes in syphilis treated with arsenicals other than tryparsamide, and (3) ocular changes in syphilis treated with tryparsamide. Four cases included in these groups are not syphilitic in origin.

OCULAR CHANGES IN UNTREATED SYPHILIS

Wilbrand and Saenger [2] have found that the optic nerve may be directly attacked by syphilis, it alone becoming diseased. In other cases, the intracranial portion of the nerve suffers as a result of a gummatous meningitis in the form of a perineuritis with gummatous interstitial neuritis, which process descends as a simple perineuritis to the orbital part of the nerve. Alexander,[3] in 1,385 cases of syphilis of the eye, found that

* From the Section on Ophthalmology, Mayo Clinic.
* Read before the Section on Nervous and Mental Diseases at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Pearce, Louise: Studies on the Treatment of Human Trypanosomiasis with Tryparsamide (the sodium salt of *n*-phenylglycineamide-*p*-arsonic acid), J. Exper. Med. (supplement) **34**: 1 (Dec.) 1921.
2. Wilbrand, H., and Saenger, A.: Die Neurologie des Auges, Wiesbaden, Bergmann **5**: 281, 1913.
3. Alexander, quoted by Wilbrand and Saenger: Die Neurologie des Auges **5**: 281.

the optic nerve was diseased in 41 per cent. Badal [4] found 21 per cent. in 139 cases; in eighty-two cases there was atrophy; in sixteen, neuroretinitis, and in three, choked disks. Talbot,[5] in his statistical researches on syphilis of the eye, found disease of the optic nerve in 14 per cent. of 434 cases.

Progressive simple optic atrophy is coincident with tabes dorsalis, and occasionally with taboparalysis. As a rule, visual disturbance accompanies pallor of the optic disks, but Uhthoff [6] reports a case in which a typical functional visual disturbance did not arise until the disks had been pale for four years. Very rarely is the visual disturbance present without disk changes. Wilbrand and Saenger [7] believe that slightly pale disks, as seen in persons with tabes dorsalis, may be due to individual structural peculiarities, simple anemia, or disturbed anlage, although true simple atrophy may develop later in such cases.

from behind forward, often only partially involving the pulvinar. In 300 cases of general paralysis investigated by Marie,[10] there were one of blindness without ophthalmoscopic findings, and two of right homonymous hemianopia. Quadrant hemianopia has also been reported. Marie believes that the prognosis of homonymous hemianopia due to syphilis is good if early treatment is instituted, and that a restitution of the vision results, as occurred in twelve cases. In four of these cases, there was permanent hemianopia, the optic tracts having been markedly injured. Uhthoff [11] describes two types of field changes that often overlap. In one type, the whole nerve is early attacked by the disease process, and there is a more or less uniform loss of central, peripheral and color vision. Discrimination between red and green is lost early, but yellow and red are distinguishable longer. Often only the color vision is reduced, the peripheral vision being preserved; but

TABLE 1.—*Summary of Ocular Phenomena Previous to Treatment with Tryparsamide*

		CASES WITH PREVIOUS ARSENICAL TREATMENT																														
		Vision			Pupils		Reflexes			Ocular Movements				Fundi			Perimetric Fields										Color Blind		
	Cases	Normal	Diminished	Questionable	Normal	Unequal	Irregular	Normal	Argyll Robertson	Reduced to Light; Accommodation Normal	Normal	Stiff	Nystagmus	Ptosis	Paralysis	Normal	Pallor of Disks	Optic Atrophy	Choroiditis	Choked Disks	Normal	Sector Defects	Hemianopia	Concentric Contraction	Color Contraction	Scotomas	Enlarged Blind Spots	No Cooperation	Red-green	Total Color
General paralysis	27	23	3	1	14	9	4	12	6	8	1	26	0	0	1	24	0	0	4	0	20	0	0	0	5	0	1	0	1	0
Juvenile general paralysis	2	1	0	1	1	1	0	1	1	0	0	2	0	0	0	2	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Tabes dorsalis	39	39	0	0	3	13	4	4	8	3	5	19	0	1	0	19	0	0	1	0	19	0	0	0	1	0	0	0	0	0
Syphilis of central nervous system	44	36	8	0	21	17	6	23	6	13	2	42	0	0	2	38	2	1	2	1	35	2	0	2	5	1	1	1	0	0
Hereditary syphilis	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Lateral sclerosis	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Multiple sclerosis	1	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Erythema exudativum	1	1	0	0	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Total	97	82	12	2	42	40	15	44	21	24	8	93	0	1	3	87	2	1	7	1	79	2	0	2	11	1	2	2	1	0
	CASES WITHOUT PREVIOUS ARSENICAL TREATMENT																															
General paralysis	8	7	0	1	5	3	0	4	1	3	0	8	0	0	0	6	1	0	1	0	5	0	0	2	0	0	0	1	0	0
Juvenile general paralysis	4	1	0	3	1	3	0	1	0	0	3	4	0	0	0	2	0	0	0	0	1	0	0	0	0	0	0	3	0	1
Tabes dorsalis	2	0	2	0	0	0	1	2	2	0	0	2	0	0	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
Syphilis of central nervous system	2	0	2	0	0	1	1	1	1	0	0	2	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Multiple sclerosis	1	0	1	0	1	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Total	17	8	5	4	9	7	1	8	2	4	3	16	1	0	0	10	1	0	3	0	6	1	2	2	0	2	0	4	0	1

Uhthoff [8] found homonymous hemianopia in eleven of 100 cases of cerebral syphilis. This is caused by the syphilitic degeneration of vessels, with hemorrhage, thrombosis, and softening of the cerebral substance, basal gummatous meningitis, and gummatous tumors of the optic tracts. The appearance of homonymous hemianopia in tabes dorsalis is to be regarded as due to a concurrent florid syphilis, or to arteriosclerosis. It is noticed in general paralysis as a late syphilitic phenomenon. Lissauer [9] noted that in progressive paralysis localized, focal disease areas appeared and gave rise to paretic hemiplegias, monoplegias and hemianopias. He found degeneration of the ganglion cells of the primary optic ganglions, marked alteration of the interstitial structures, and degeneration of the fibers. The disease appeared to spread to the thalamus it contracts later. In the other type, the optic nerve is only partly affected, and the diseased parts show sharply demarcated field defects.

Behr's [12] contraindications for treatment for syphilis are: (1) diminished central vision, loss of color vision with normal, or almost normal form fields; (2) high grade concentric contraction, both for form and colors, but with central vision normal; (3) transitory visual field disturbance, more in form than in colors, normal central vision, with well marked simple optic atrophy, and (4) subjective complaint of photopsia. (Von Hippel believes that Behr's list excludes most of the cases from treatment.) Rönne [13] believes that color vision and visual acuity are supplied by the same nerve fibers, and that a loss of a given number of fibers must lead to a proportional decrease in function. Disproportionality is explained by conduction resistance of the single fibers, which then are passable for only one of the two functions. Rönne found proportionality in stationary

4. Von Badal, quoted by Wilbrand and Saenger: Die Neurologie des Auges **5**: 281.
5. Talbot, quoted by Wilbrand and Saenger: Die Neurologie des Auges **5**: 281.
6. Uhthoff, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 433.
7. Wilbrand and Saenger, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 434.
8. Uhthoff, quoted by Wilbrand and Saenger: Die Neurologie des Auges **7**: 172, 1917.
9. Lissauer, quoted by Wilbrand and Saenger: Die Neurologie des Auges **7**: 186.
10. Marie, quoted by Wilbrand and Saenger: Die Neurologie des Auges **7**: 187.
11. Uhthoff, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 437.
12. Behr, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 478.
13. Rönne, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 438.

neuritic atrophy, as well as in slowly progressive tabetic atrophy, and he found disproportionality in rapid and malignant progressing atrophy. He believes that disproportionality is an especially unfavorable prognostic sign.

According to Uhthoff,[14] the central scotoma with untouched peripheral fields, as seen in axial neuritis, practically never occurs in simple tabetic optic atrophy. Von Hippel[15] asserts that before the central scotoma can be ascribed to tabes dorsalis, alcohol, tobacco poisoning, accessory nasal sinus disease and diabetes must be ruled out.

There were seventeen cases in this group, in one of which syphilis was not an etiologic factor. It is interesting to note that in about 50 per cent. of the cases there were changes in vision, pupils, reflexes, fundi and perimetric fields. A relative central scotoma for form and color was found in one case of tabes dorsalis, which, according to Uhthoff, seldom if ever occurs.

cases, with marked improvement. Koch[17] reported a large group of cases of blindness due to atoxyl in trypanosomiasis. Igersheimer[18] describes the visual complaints in atoxyl poisoning as blurring vision, and dark spots before the eyes. The ophthalmoscopic picture is usually negative, and the visual disturbance, if any, is slight. In other cases, the disks are pale and the nasal fields contracted. At no time could a central scotoma be established, either early or late. Finally, a few cases were seen in which the visual fields were contracted peripherally, the visual acuity was diminished, the pale disks became atrophic, and the pupils dilated and stiff. A few isolated cases with central scotomas have been reported by Rosenfeld,[19] which were thought to be due to a chronic arsenic poisoning.

There were ninety-seven cases in this group, in three of which syphilis was not an etiologic factor. In 12 per cent. there were visual changes, in 50 per cent. pupillary and reflex disturbances, in 9 per cent. fundus

TABLE 2.—*Ocular Complaints During Treatment with Tryparsamide*

Case	Previous Treatment	Injections of Tryparsamide	Diagnosis	Vision		Fundi	Perimetric Fields	Course Under Treatment
				Right	Left			
1	Intensive	4	Syphilis of central nervous system	6/7	6/6	Normal	Irregular concentric contraction	Vision and fields decreased, then improved
2	Moderate	5	Syphilis of central nervous system	6/5	6/5	Normal	Binasal type of concentric contraction	Fields decreased in size; vision remained the same
3	Intensive	20	Syphilis of central nervous system	6/6	6/6	Old choroiditis each eye	Concentric contraction, more in right eye	Subjective complaints; no change in vision or fields
4	Moderate	7	General paralysis	6/10	6/10	Normal	Normal	Vision decreased to 6/15 each eye; fields diminished to central fixation only
5	None	30	General paralysis	6/6	6/6	Normal	Concentric contraction, more in right eye	Subjective complaints; no change in vision or fields
6	None	10	General paralysis	6/7	6/7	Normal	Normal	Subjective complaints; no change in vision or fields
7	Intensive	10	Syphilis of central nervous system	6/5	6/6	Normal	Binasal contraction for form and colors	Fields and vision decreased under treatment with arsphenamin to a central scotoma of left eye; subjective complaints under treatment with tryparsamide, but there was no change in vision or fields
8	Moderate	20	General paralysis	6/6	Glass	Old choroiditis lower periphery of right eye	Normal	Subjective complaints; no change in vision or fields
9	Moderate	12	General paralysis	6/6	6/6	Normal	Normal for form, contracted for green	Subjective complaints; no change in vision or fields
10	Moderate	4	Syphilis of central nervous system	6/5	6/5	Normal	Normal	Subjective complaints; no change in vision or fields
11	Intensive	4	Syphilis of central nervous system	6/30	6/30	Bilateral choked disk 4 to 5 diopters	Concentric contraction for form and colors; blind spots enlarged	Vision improved to 6/10, choked disks receded to less than 1 diopter under arsphenamin; subjective complaints with tryparsamide, but no change in vision or fields
12	None	10	Multiple sclerosis	6/30	6/30	Retinal arteries contracted	Form normal; colors contracted	Subjective complaints; vision right eye improved to 6/15; fields did not change
13	Intensive	8	Syphilis of central nervous system	6/12	6/7	Slight pallor of right disk	Definite notching lower nasal quadrants both eyes	Vision decreased under tryparsamide

The other field changes were not of an unusual type. Most of the patients are now being treated either with arsphenamin or with tryparsamide and so far none have shown a decrease in vision or fields. In Table 1 are shown the changes found in the cases in this group.

OCULAR CHANGES IN SYPHILIS TREATED WITH ARSENICALS OTHER THAN TRYPARSAMIDE

It has been said that arsphenamin is neurotropic; but von Hippel found, by experimentation, that no injury to the optic nerve and retina was produced, and no clinical proof of the harmful action of the arsenic component of the drug has been demonstrated. In all cases in which fresh optic nerve inflammation arises after arsphenamin treatment, one has to deal with a provocative syphilitic process caused by the administration of insufficient dosage. This agrees with the findings of Benedict and O'Leary,[16] who administered arsphenamin in both syphilitic and nonsyphilitic uveitis and retinitis

changes, and in 20 per cent. perimetric field disturbances.

There were nine cases in which previous arsphenamin treatment had revealed visual and perimetric field defects. In four, the ocular changes became progressively worse (Cases 7, 14, 15 and 20); in two cases, there was considerable improvement (Cases 11 and 16), and in three there was no change in vision or fields (Cases 17, 21 and 23). In Case 7, the visual field became smaller and vision decreased during arsphenamin treatment, on account of a central scotoma of the left eye. In Case 14, the visual fields became progressively smaller during treatment with arsphenamin, but the visual acuity did not change. In Case 11, the vision improved and the choked disks receded, becoming practically normal during arsphenamin treatment. The visual fields remained the same, but the size of the blind spots returned to normal. In Case 16, the vision improved in both eyes during arsphenamin treatment; blindness in the left eye changed to 1/60. The visual fields improved from a temporal hemianopia

14. Uhthoff, quoted by Wilbrand and Saenger: Die Neurologie des Auges, 5: 288.
15. Von Hippel, E.: Graefe-Saemisch Handbuch, Berlin, Springer, 1923, vii, b, pp. 385 and 440.
16. Benedict, W. L., and O'Leary, P. A.: The Use of Antispecific Remedies in the Treatment of Diseases of the Uveal Tract, Tr. Pacific Coast Oto-Ophthal. Soc., 1922, pp. 44-51.
17. Koch, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 379.
18. Igersheimer, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 379.
19. Rosenfeld, quoted by von Hippel: Graefe-Saemisch Handbuch, p. 379.

in the right eye to an homonymous hemianopia, and finally a complete ring of vision with an absolute central scotoma in the left eye.

OCULAR CHANGES IN SYPHILIS TREATED WITH TRYPARSAMIDE

Pearce [1] reports visual disturbances in certain advanced cases of trypanosomiasis in human beings which were related, apparently, to a too frequent administration of the drug. The condition was transitory in most instances, and resumption of treatment was not followed by a recurrence of the symptom. Lorenz [20] and others found that 40 per cent. of their patients complained of dimness of vision. The condition was transient in all except two cases, in which the patients had abnormal eyegrounds before treatment. The authors emphasize the fact that tryparsamide possesses the potentiality of injuring the optic tract, and that it should not be used in cases with degenerative changes in the retina. Moore [21] and others believe that optic nerve involvement in neurosyphilis is an absolute contraindication for tryparsamide. In fourteen of 150 cases, dimness of vision was a complaint. In ten of these, the visual disturbance was slight, and cleared up when the treatment was discontinued. In one case, in which there had been neuroretinitis, a slight permanent visual defect resulted. In three, there were severe visual disturbances, with a marked residium. The authors believe that the lesion produced by tryparsamide is apparently a toxic amblyopia due to a retrobulbar neuritis, and conclude that disease of the optic nerve or retina, particularly optic neuritis or neuroretinitis, or primary or secondary optic atrophy, should be rigidly excluded from treatment by tryparsamide.

There were 114 cases in this group, in thirteen of which visual disturbances occurred during treatment with tryparsamide. In nine, the complaints were subjective, such as blurred vision, flashes of light, and fatigue on close work, but the vision and perimetric fields did not change. In four, there was a definite decrease in vision and perimetric fields. In Cases 7 and 11, there were subjective complaints, but no changes in the vision and fields beyond those already noted during the previous treatment with arsphenamin.

Four cases showed changes during treatment with tryparsamide. In Case 1, the vision in each eye decreased from 6/6 to 6/15 in both eyes. The fields were somewhat more contracted. When tryparsamide was discontinued, the fields and vision returned to normal. In Case 2, the perimetric fields decreased in size slightly during treatment, but the central vision remained the same. In Case 4, the vision and perimetric fields decreased considerably during tryparsamide treatment. Unfortunately, detailed perimetric fields were not obtained before treatment, although they were normal to a rough test. In Case 13, the vision decreased slightly during treatment, but the perimetric fields did not change.

TABLE 3.—*Ocular Changes Without Treatment with Tryparsamide*

Case	Previous Treatment	Diagnosis	Vision		Fundi	Perimetric Fields	Course Under Treatment
			Right	Left			
14	Intensive	Syphilis of central nervous system	6/20	6/20	Pallor of disks	Bitemporal hemianopia with island of temporal vision in both eyes	Fields progressively decreased, vision remained the same
15	Intensive	Syphilis of central nervous system	6/30	6/15	Simple optic atrophy in both eyes	Concentric contraction with loss of red and green color vision	Fields progressively decreased, absolute central scotomas developed; became partial total color blind
16	Intensive	Syphilis of central nervous system	6/6	Nil	Pallor of disks with perivasculitis	Temporal hemianopia of right eye; blind in left eye	Improved to a right homonymous hemianopia, with ability to count fingers with left eye
17	Intensive	Syphilis of central nervous system	6/7	6/60	Pallor of disks	Left homonymous hemianopia	No change
18	None	Tabes dorsalis	6/7	e.f.	Pallor of disks	Right, normal; left, nasal hemianopia involving macula	No change
19	None	Syphilis of central nervous system	6/6	e.f.	Right, normal; left, pale disk, old choroiditis	Right, normal; left, nasal hemianopia involving macula	No change
20	Intensive	Syphilis of central nervous system	6/7	Nil	Pallor of disks	Right, temporal hemianopia; left, blind	Progressed to blindness in right eye in one week without any treatment
21	Intensive	Syphilis of central nervous system	6/5	6/5	Negative	Normal for form; colors contracted	No change
22	None	Syphilis of central nervous system	m.o.	6/5	Right, not seen; left, normal	Right, small area of vision upper temporal quadrant; left, normal	No change; secondary glaucoma with complicated cataract in right eye treated locally with relief of pain
23	Intensive	Syphilis of central nervous system	6/6	Nil	Mild neuritic atrophy in left eye	Right, normal; left, blind	No change

SUMMARY

The ocular findings in the 114 cases have been summarized in Table 1. The majority of the patients received a maximal dosage of 3 gm. of tryparsamide intravenously, combined with 1 grain (0.06 gm.) of mercuric salicylate intramuscularly at weekly intervals. Ten injections of each composed one course of treatment. One hundred and ten of the patients were syphilitic; four were not syphilitic. Seventeen patients, one of whom was not syphilitic, were not treated for syphilis, and before treatment with tryparsamide was instituted, about 50 per cent. had changes in vision, pupils, reflexes, fundi and perimetric fields. From this it might be concluded that syphilis alone was responsible for these ocular changes. Ninety-seven patients, three of whom were not syphilitic, had been given arsenical treatment previously. Only 12 per cent. of these patients had visual changes, 50 per cent. had pupillary and reflex disturbances, 9 per cent. had fundus changes, and 20 per cent. had perimetric field changes. If these percentages are compared with those of the untreated cases, it must be concluded that arsenical treatment is very efficient in reducing the changes in vision, fundi and perimetric fields. The pupillary and reflex disturbances are

20. Lorenz, W. F.: The Treatment of Central Nervous System Syphilis with a New Arsenical, Wisconsin M. J. **20**: 336-337, 1922. Lorenz, W. F.; Loevenhart, A. S.; Bleckwenn, W. J., and Hodges, F. J.: The Therapeutic Use of Tryparsamide in Neurosyphilis, J. A. M. A. **80**: 1497 (May 26) 1923.

21. Moore, J. E.; Robinson, H. M., and Keidel, Albert: Tryparsamide in the Treatment of Syphilis, J. A. M. A. **82**: 528-535 (Feb. 16) 1924.

of the same percentage in the two groups, which indicates that treatment does not affect the pupillary anomalies. In nine cases of visual and perimetric defects, four patients became progressively worse, two improved considerably, and three had no change of the vision or perimetric fields during arsphenamin treatment.

In thirteen of the 114 cases, there were visual disturbances during treatment with tryparsamide. In four cases, the vision and fields definitely decreased, and in nine cases no visual or perimetric field changes could be demonstrated. In one case (Case 12), the vision in one eye improved during treatment with tryparsamide.

As soon as any change in the vision or fields could be demonstrated, treatment was stopped; the end-results cannot, therefore, be determined. However, a definite toxic effect of the drug was not demonstrated, as a central scotoma was not found in any case during the treatment with tryparsamide. In two cases (2 per cent.), definite central scotoma developed during treatment with arsphenamin (Cases 7 and 15). In one case (6 per cent.), definite central scotoma developed without treatment for syphilis.

The treatment did not seem to influence the pathologic changes observed in the fundus. Visual and perimetric field changes occurred as often during treatment in cases in which the fundi were normal as in those in which they were not.

CONCLUSIONS

1. Changes in vision, fundi and perimetric fields are much greater in cases of untreated syphilis of the central nervous system than in treated cases.

2. Pupillary and reflex changes are practically the same in treated and untreated cases of syphilis of the central nervous system.

3. Ocular changes occurred as often with arsphenamin treatment as with tryparsamide treatment.

4. The use of tryparsamide is not contraindicated by pathologic changes in the fundus.

5. The arsenicals are apparently efficient in decreasing ocular changes in syphilis of the central nervous system.

6. In this select series of cases, tryparsamide was not more harmful to the eyes than any form of arsenic used in the treatment of syphilis of the central nervous system.

Sparganum Prolifer Infection.—R. M. Marjoribanks and Elizabeth J. O. Le Sueur report what they believe to be the third case on record. The symptoms, consisting of cough commencing with irritation on the left side of the throat, had been present three months. Attacks appeared on alternate days; during each, two or three "worms" were coughed up. The patient, a Chinese student, aged 22, was found to be well nourished. There was a slight bulging of the left sternomastoid muscle, below which a deeply lying tumor, about twice the size of the thumb, could be palpated. It extended from below the angle of the jaw to the larynx. Laryngoscopically the larynx was normal, but a spongy patch could be detected below the left tonsil. This could be palpated with the forefinger, and bits removed were found to contain small *Sparganum* bodies. According to the patient's statement, he had coughed up in all about 150 worms. These were found to vary in size from that of a pin's head to bodies measuring 8 by 6.5 mm. They were mostly bean shaped, with prominences on one side. Some had distinct heads and tails, and centrally situated prominences. A thin membrane limited the contents. When fresh, the bodies were cream colored and of the consistency of soft cheese. Microscopically, the contents were found to consist of a white, granular material with food vacuoles and oily globules.—*Tr. Royal Soc. Med. & Trop. Hyg.* **18:70** (March-May) 1924.

CERTAIN PROBLEMS IN THE TREATMENT OF DISEASES OF THE THYROID GLAND*

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The possibility and efficiency of the practical application of the administration of iodin for the prevention of goiter as a public health measure were definitely established by Marine and Kimball in their classical experiment in the public schools of Akron, Ohio, in 1917. As the result of that study, the application of this principle of goiter prevention has been extended to various endemic goiter districts in this country and abroad, so that today children in various parts of the world are being benefited by prophylactic treatment, and the incidence of goiter is by so much diminishing.

For a practical consideration of the problems of goiter, we may consider three abnormal states of the thyroid gland—hypothyroidism, malignancy and hyperthyroidism.

HYPOTHYROIDISM (SIMPLE GOITER)

The problems presented by simple goiter are comparatively easy of solution.

1. *Prevention.*—I have already referred to the possibility and duty of preventing the incidence of simple goiter in the present generation by the administration of iodin throughout adolescence: in the coming generation, by giving iodin to expectant mothers throughout the periods of pregnancy and lactation.

2. *Functional Deficiency.*—In cases of functional deficiency in adults, the condition may be controlled by the supervised administration of some form of iodin, thyroxin or thyroid extract.

3. *Colloid Goiters and Diffuse Adenomas Causing Pressure Symptoms.*—These should be excised. It should be emphasized that the administration of iodin to either adults or children will not remove fetal adenomas, but may produce hyperthyroidism—a condition identical with that associated with the so-called toxic adenoma, which I regard, not as a clinical entity, but as one form of hyperthyroidism. This tendency of adenomas to produce hyperthyroidism, myocarditis and high blood pressure supplies a second reason for their removal.

Another reason for excising fetal adenomas is found in the results of studies by Allen Graham, who has found that in more than 90 per cent. of cases of malignant tumors of the thyroid, the growths arose in fetal adenomas, and that in a microscopic examination of all the fetal adenomas removed by my associates and me, whether or not malignancy was suspected, one in eight was found to be cancer

My personal surgical experience, on which this discussion is based, includes 7,617 operations on the thyroid gland, this number including 2,809 thyroidectomies for hyperthyroidism, and 1,922 ligations.

MALIGNANT TUMORS OF THE THYROID

We have dealt surgically with 107 cases of malignant tumors of the thyroid gland. In 102 cases, thyroidectomy was performed for cure; in five cases, decompression only. Eighty-two of these patients have been traced, twenty-three of whom are living, five or more years after operation.

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

The prevention of cancer by the routine removal of fetal adenomas is on a par with the prevention of cancer by the removal of moles, scars, irritations and ulcer, and the repair of lacerations of the cervix. But even more brilliant than the prevention of cancer is the prevention of the fetal adenoma in the child by giving the mother iodin during pregnancy. That is, as has already been stated but should be emphasized again, cancer of the thyroid in the next generation can be prevented by giving iodin in this generation.

HYPERTHYROIDISM

At the outset, let us admit that we know of no specific pathologic basis for the syndrome that we designate as "hyperthyroidism." We have not sufficient information regarding the mechanism of the disease to argue regarding its pathology. We admit that there is no specific criterion whereby to establish the diagnosis in the borderline cases; that is, to determine at what stage altered function on the outer boundaries of normality ends and hyperthyroidism begins. Although we must admit these uncertainties, on the other hand in our series we have found no case of hyperthyroidism associated with a normal thyroid. We know that hyperfunction of the thyroid gland is an essential factor in the disease, and that, therefore, to secure maximum results in the treatment of hyperthyroidism, a sufficient amount of the gland must be resected at an early stage in the disease.

We believe that we now have sufficient data on which to base the judgment that, important as is the partial rôle of a rest cure, roentgen ray, radium, any form of iodin, thyroid extract, general medication, general hygienic regulation, the overcoming of autointoxication, the removal of focal infections, or dietary control in the treatment of this disease, no one of these measures, and not all combined, approach the certainty and efficiency of surgical treatment as the primary mode of attack, supplemented by the measures mentioned above. This conclusion is based not only on the immediate but also on the remote mortality, that is, on the expectancy of life no less than on the conservation of organic function and the general well-being of the individual. Surgical treatment, supplemented by whatever lesser means of attack are indicated in the individual case, not only conserves life and function but is of economic value also; viz., it is the shortest road to recovery.

The problem presented by the patient with hyperthyroidism is precisely the same as that which would be presented by a patient—and right now there are many such patients—who is taking thyroid extract or iodin in such amounts as to cause definite symptoms of hyperthyroidism. In the latter case, would it be best to control the racing heart and overworked myocardium by a rest cure, sedatives, digitalis, bromids, irradiation of the gland, diet, change of scene—by any or all of these lesser expedients—or would it be best first to stop the taking of the drug itself and then supplement the restoration by these valuable adjuncts?

In hyperthyroidism, the thyroid gland is the druggist, an extraordinary druggist, a tireless druggist, who day and night is manufacturing and turning into the circulation the exciting hormone.

To justify our conviction that surgical treatment is the central, the primary mode of attack against hyperthyroidism, it is essential to show that the immediate mortality is less than from the nonsurgical treatment, that the end-results are better. The mild cases may be excluded, for in these there is a negligible surgical risk. The crucial test is presented by the fully developed case, which has reached the terminal stage characterized by emaciation, cardiac decompensation, swollen extremities, ascites, vomiting, acidosis and prostration—the case that is nearing final dissolution, or that shows repeated periods of, or continuous, delirium.

In such cases, the surgical problem is this: Is the state one of hopeless dissolution in which, even were it possible by a miracle to wish out the thyroid, death still would be inevitable? Can we differentiate between the quick or the dead? This, we have found, can be done almost with certainty by the application of a biologic test consisting in the following measures:

1. Restoration of the water equilibrium to the desiccated cells, by subcutaneous infusions of from 2,000 to 4,000 c.c. of one-third per cent. procain solution in twenty-four hours, after Bartlett's method.

2. Digitalization of the failing myocardium, whose feeble effort is not sufficient to assure the circulation of the blood in the essential organs—the myocardium, the brain, the liver, etc.—leaving these organs at this critical time in a state of relative anemia.

3. Increasing the blood volume—and oxygen carriers—by means of blood transfusion.

4. Modifying and controlling the ceaseless, exhausting restlessness and tension—physical and mental—by sedatives, and especially by the service of nurses fitted by natural endowment and by special training to assuage, cajole and quiet.

If, after this biologic test, consisting in these measures, has been applied, the downward course of the patient continues unchecked, as happens only in about one in 500 cases, then inevitable dissolution and death are before us.

On the other hand, and happily this is almost always the case, if the vomiting ceases and the delirium grows less and clears, then the patient is viable, and just as soon as the utmost value of the restorative program has been achieved—usually within a few days—a ligation of one pole is done in the patient's room, under local anesthesia alone or, in occasional cases, supplemented by nitrous-oxid analgesia. Usually, on the third day thereafter, the other pole is ligated and, a few days later, the patient is sent home for a period of hygienic control, the routine of which has been carefully prepared and written out for his daily guidance.

After from ten to twelve weeks, the margin of safety will be widened sufficiently to permit the resection of one or, usually, both lobes, after which the patient is again sent home to repeat the same hygienic program for a prolonged period.

By thus seizing and holding the initiative, the average length of time in the hospital before the ligations or thyroidectomy has been reduced to three and one-half days. In a recent analysis of the histories of 1,200 consecutive thyroidectomies, the average hospital preoperative and postoperative periods covered six days.

In actual experience, we have found that in 1,415 consecutive ligations, the mortality has been 0.63 per cent., and the average reaction has been just a little less than that occasioned by the entrance to the hospital—thus, the mortality of ligations is almost exactly the same as the mortality attending admission to the hospital. That is to say, in general, whoever is able to go to the hospital at all survives the ligation. If he survives the first ligation, he the more certainly survives the second. If he survives both ligations, he almost certainly improves enough for a safe thyroidectomy. In other words, no diagnostic tests such as metabolism measurements are required; only sound judgment, biologic measures of

protection, and controlled technic are necessary for survival.

After operation, every resource at our command is required to build up the final end-result.

SUMMARY

Since the present plan of management has been carried out, there have been no deaths from so-called hyperthyroidism; the occasional death—approximately one in 100—is due to some complication, e g., heart failure, cerebral hemorrhage or pneumonia.

Goiter is among the most preventable of diseases; its treatment, in whatever form it presents itself, is accurately defined.

1. Prevention is achieved by the administration of iodin throughout adolescence and pregnancy.

2. Simple goiters should be excised if they cause pressure or are adenomatous.

3. Malignant goiters should be excised if possible; or they should be decompressed, followed by radiation.

4. For hypofunction, the essential product that is lacking should be added.

5. For hyperfunction, the essential product that is overabundant should be diminished.

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CERTAIN BLOOD DYSCRASIAS DEPENDENT ON PATHOLOGIC CONDITIONS OF THE SPLEEN *

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The blood may be considered an organ consisting of cellular, colloid and crystalloid substances in a liquid medium, and the vascular system a means of transportation which carries these various substances to the tissues of the body and removes waste products. The total volume of blood in the body of the average person is estimated by Mann [1] at from one thirteenth to one tenth of the body weight. Krogh and Haldane [2] have shown that, in man at rest, each cavity of the heart expels about 4 liters of blood a minute. During violent exertion, to supply the necessary amount of oxygen to the tissues, the entire volume of blood passes through the heart and around the body every ten seconds, and the amount expelled by the heart each minute is increased from 4 to 24 liters.

The vital constituent of the blood is oxygen. The supply of oxygen to the extremities can be cut off safely for several hours, but if the circulation of the blood through the central nervous system is stopped for more than from seven to ten minutes, death ensues. If there is shortage of oxygen from actual hemorrhage, the blood pressure drops, and the efforts of the heart and the respiratory system are increased in order to hasten oxygen to the tissues. The rapid action of the circulatory and respiratory systems throws out the carbonates from the blood as in normal respiration, and the rapidity of respiration tends to exhaust them. Seventy-five per cent. of the body is composed of water. Filling the veins with sodium chlorid solution to increase the blood pressure in case of shortage of oxygen from hemorrhage is of no benefit, for the red cell oxygen carriers are not increased, although their medium is diluted; nor is the blood volume materially increased, because the water will not stay in the blood vessels. Transfusion of blood, which adds to the oxygen-carrying capacity, is indicated for serious hemorrhage and for anemia. Just how much a single transfusion of blood will raise lowered blood pressure is still under discussion. Taking the hemoglobin as an index, a reasonable transfusion of from 500 to 600 c.c. cannot be expected to raise the hemoglobin index more than from ten to twenty points. Repeated small transfusions, on the whole, give better results than a single large one, provided the first transfusion is sufficient to maintain life.

If the cause of oxygen shortage is overexertion, the sudden failure of the mechanisms of circulation and respiration, as in acute dilatation of the heart, and the rapid elimination of the carbonates which accompanies fatigue, tend to produce acute acidosis and failure to eliminate the products of combustion. In such cases there are plenty of oxygen carriers but, temporarily, too little oxygen and too little carbonate, which prevents the transformation of the accumulated waste into carbon dioxid. Transfusions of blood would be harmful, but phlebotomy may be indicated to relieve the circulation and prevent a breakdown of the transportation system.

Forty-seven per cent. of the known earth, including atmosphere and water, is composed of oxygen. Considering how vital and immediately necessary oxygen is to animal life, it is surprising that there is no storage capacity in the body, either for oxygen or for substances which, under stress, would produce it.

If the process of circulation is studied in detail, it is apparent that the red cell transports oxygen from the lungs to the tissues of the body, and on its return for a fresh supply of oxygen aids the blood plasma in carrying carbon dioxid to the lungs for exhalation. The red cells also act as carriers of vital molecular substances to the tissues. Hemoglobin is the most important of these substances, containing one atom of iron to the molecule. Anything which reduces the number of the red cells, whether actual blood loss or those various agents, infectious and otherwise, which produce secondary types of anemia, either through destruction of red cells or the production of toxic substances which prevent their formation or their function, is a serious menace to life and health.

SPLENIC ANEMIA

The spleen, in the adult, like other organs of the reticulo-endothelial system, has for one of its proper functions the destruction of deteriorated red cells. When the spleen is enlarged, as from splenic anemia or hemolytic icterus, this destruction may become excessive and produce the chronic anemia that leads to death, directly, or indirectly through intercurrent disease.

The term "splenic anemia" in itself indicates a syndrome of many causes, and not an entity. In the ninety-eight cases in the Mayo Clinic in which the spleen was removed for splenic anemia, micro-organisms were not secured on culture; yet the spleen, revealing interiorly the enormous development of a protective type of fibrous tissue, thrombophlebitis, and atrophy of the pulp cells, and exteriorly the adhesions that bind it to the surrounding organs, gave the impression that the disease is the result of infection by bacteria which are short-lived and have disappeared or, one might better say, have been destroyed. Experience leads us to believe that when a pathologic process in the spleen is once set

* Read before the Section on Surgery, General and Abdominal, at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Mann, F. C.: Shock and Hemorrhage: An Experimental Study, Surg., Gynec. & Obst. 21: 430-441, 1915.

2. Krogh and Haldane, quoted by Starling, E. H.: The Wisdom of the Body, Lancet 2: 865 (Oct. 20) 1923.

in motion, even if the cause of the hyperactivity is overcome, there is a tendency for the condition to become chronic, and its later progress is little influenced by any form of conservative treatment.

In the later stages of splenic anemia, the liver is often involved in the portal cirrhosis described by Banti. Removal of the spleen in such cases not only may be life-saving, but restores the patient to usefulness. The liver may be involved in the cirrhotic process, and circulatory obstructions due to the deposit of connective tissue around the portal vessels in the liver may cause ascites, hemorrhages from the stomach, and so forth; yet the majority of patients, even those in the terminal stage of the disease, may be restored to a condition closely resembling normal health. However, about 13 per cent. of patients with advanced disease who have had hemorrhages before splenectomy may have hemorrhage after splenectomy which acts as a contributory cause of death, at some time within the next ten years.

The operative death rate in cases of splenic anemia depends largely on the cases accepted for operation. A mortality of 10 per cent. almost entirely confined to patients in the terminal stages of the disease, when the liver as well as the spleen is involved, may be expected and, I believe, is justified. One cannot refuse to operate on these bad risks, since, even in terminal cases, a large number of patients recover and live for years. Studies of hepatic function before operation will eliminate some of the operative fatalities.

The splenomegalia of syphilis, because it is due to a resistant protozoan which can be detected in the tissues of the spleen, has been split off from the splenic anemia group, although the essential gross pathologic condition, excluding for the moment the gumma and the spirochetes, is quite the same as in other forms of splenic anemia for which a cause has not yet been found. Nine patients with what might be called syphilitic, splenic anemia were splenectomized in the clinic. All the patients were in advanced stages of syphilis and had been thoroughly treated without cure; several had gumma in the liver as well as in the spleen. One patient died in the hospital; eight were cured, all evidences of the syphilis and the anemia disappearing in the course of a few weeks, with little or no after-treatment.

HEMOLYTIC ICTERUS A SYNDROME

The cause of hemolytic icterus is not known; but, as pointed out by Elliott and Kanavel,[3] it is known that the enlarged spleen is the active agent in the destruction of red cells. Hemolytic icterus is the result of a splenomegalia, with affects chiefly the red blood cell, and is of two types: that described by Minkowski [4] as congenital or familial, and that described by Hayem [5] and by Widal [6] as acquired. The congenital or familial type may occur in several members of the same family, and perhaps for several generations. The patient, possibly from birth or early childhood, is jaundiced, has an enlarged spleen and an enlarged liver, and is subject to sudden so-called crises in which there is a temporary increase in the size of the spleen and liver, and an increase of the jaundice, fever and malaise, which lasts for a number of days and gradually merges into the usual condition of more or less chronic icterus. In every community are to be seen persons with so-called chronic biliousness of this description, some of whom may live to the fifth or sixth decade. Usually, death results from anemia or intercurrent disease in early life. Sections removed from the liver reveal more or less hyperplasia; and it may be that the enlargement in both the spleen and the liver is to some extent work hypertrophy. The acquired type of hemolytic icterus comes on later in life, often in the adolescent period, pursues a more rapid course, and, as a rule, in the course of a few years ends in death from anemia or intercurrent disease. The outstanding feature of hemolytic icterus is the fact that the jaundice is not obstructive. The stools are normal in color, and there is no bile in the urine. Experience in the Mayo Clinic shows that 60 per cent. of the patients, even the very young, have coincident pigment gallstones, the result of the enormous number of destroyed red corpuscles, the pigment of which forms the main source of the pigment of the bile. The gallstones sometimes cause biliary duct infection, which accounts for the occasional occurrence of a confusing obstructive jaundice in the patient with hemolytic icterus.

The spleen has been removed in the Mayo Clinic in fifty-one cases of hemolytic icterus, with three deaths in the hospital, only one of which was directly connected with the operation. The results of splenectomy in this disease are little short of marvelous. The patient, perhaps jaundiced through life, becomes white in a few days, the anemia disappears quickly, and health is restored and maintained.

Following Eppinger's suggestion that the spleen might be an active agent in destroying the red cells in cases of primary anemia, splenectomy was quite generally performed in cases of pernicious anemia; but the failures to secure prolonged improvement were numerous, and the fact that the operation was not free from risk soon brought splenectomy into disrepute. The pathologic condition of the spleens removed did not show direct connection between the spleen and pernicious anemia.

Splenectomy was performed in the Mayo Clinic in sixty-one cases of pernicious anemia, with three deaths in the first nineteen cases, in which operation was performed during the terminal stages of the disease without due preparation. In the forty-two cases in which splenectomy has been performed since then, the patients have been prepared by blood transfusion, and there have been no deaths. Splenectomy should not be performed while patients are in crisis, that is, during the more active manifestations of the disease. All the patients who recovered from the operation were strikingly benefited at once; the benefit was much greater than had resulted from transfusion of blood or any other form of treatment. About 22 per cent. of the patients lived two and one half times as long as those in a comparable group who were not splenectomized, and about 10 per cent. lived more than five years and were able to work. If this extension of life is compared with the life expectancy of two years which is accorded the average patient under any other form of treatment, the results are not wholly discouraging. Perhaps we have expected too much, and our prejudice against operation has blinded us to what has actually been accomplished. In the aplastic types of pernicious anemia, especially in elderly patients and in poor subjects for operation, the relief gained from operation is not worth the risk; but for

3. Elliott, C. A., and Kanavel, A. B.: Splenectomy for Hemolytic Icterus, Surg., Gynec. & Obst. **21**: 21-37, 1915.

4. Minkowski, O.: Ueber eine hereditäre, unter dem Bilde eines chronischen Icterus mit Urobilinurie, Splenomegalie und Nierreraiderrois verlaufenden Affection, Verhandl. d. Kong. f. inn. Med. **18**: 316, 1900.

5. Hayem, G.: Sur un variété particulière d'ictère chronique, ictère infectieux chronique spléno-mégalique, Presse méd. **1**: 121, 1898; Nouvelle contribution à l'étude de l'ictère infectieux chronique splénomégalique, Bull. et mém. Soc. méd. d. hôp. de Paris **28**: 122, 1908.

6. Widal, A., and Brulé: Differentiation de plusieurs types d'ictères hémolytiques, Presse méd., 1907, pp. 641-644, quoted by Elliott and Kanavel (Footnote 3).

patients with the more chronic types of the disease who are otherwise good subjects for operation, and for younger patients, the operation should be considered. Splenectomy in such cases is comparatively safe.

POLYCYTHEMIA RUBRA

Another red cell syndrome of which little is known is polycythemia rubra vera, described first by Vasquez, and later by Osler. In this malady, the spleen and, usually, the liver are enlarged. The hemoglobin ranges from 100 to 130, and the red cells from 6,000,000 to 14,000,000. The patients become exhausted gradually, often suffer from hemorrhages of the stomach, and seldom reach middle life. Postmortem examination reveals specific lesions. It has been believed that the spleen is only an incident in the disease, but a typical case is on record in the clinic of a physician, aged 28, who was promptly restored to health by removal of the spleen, and has remained well for more than two years. This one case, however, is only of suggestive value.

Besides its effect on the red cells, the diseased spleen exerts a destructive influence on the blood platelets, an action that is little understood. The normal range of blood platelets varies from 225,000 to 300,000. When the platelets are reduced to less than 40,000, although the blood clots, the bleeding time is dangerously increased; this is the condition in the purpuras. The only known method of supplying blood platelets is by transfusions of blood. In the acute toxic forms of purpura that are accompanied by a reduction in blood platelets to a proportion as low as 10,000, repeated blood transfusions in certain cases are the most effective remedy. There is a chronic type of purpura, coming on often at the adolescent period, which leads to death. The patient suffers from hemorrhage under the skin, in the stomach, and from the nose; and the female, from exhausting menorrhagia. The disease is progressive, with periods of temporary betterment, especially as a result of blood transfusion. The spleen is always enlarged. It certainly seems foolhardy to perform splenectomy if the patient has a bleeding time of fifty-five minutes, but experience has shown that the removal of the spleen under such circumstances results in the most extraordinary benefit. The patient gets well and remains well. In seventy-two hours, possibly, the blood platelets may increase from less than 40,000 to 700,000. We have removed the spleen from four patients with chronic purpura. Two were women, one aged 30, and one 20, who were cured immediately; one was a girl, aged 11 years, and one was a man, aged 21. In the course of a few days, the patients were apparently restored to health.

The relation of the spleen to the production of white blood cells is well understood, but not so its relation to the pathologic condition of the white cells. Hematology is one of the newer sciences. The clinician has rightly been conservative in accepting unsupported laboratory findings, but a study of these findings in the light of the clinical facts has gradually brought order out of chaos. The surgeon today is influenced greatly in deciding on the surgical treatment of an acute infection by the upward or downward progression of the white cell count, and has learned that differentiation of the white cells of itself brings out important clinical facts.

It is not altogether fanciful to regard the white cell as the original blood cell. The blood of the invertebrate is white blood. The first blood in the fetus is white blood, and the assumption that the red blood is a descendant of the white blood is tenable. In the chronic types of leukemia, the white cell count runs high.

SPLENOMYELOGENOUS LEUKEMIA

Splenomyelogenous leukemia, as its name implies, is more concerned with the spleen than any of the other forms of leukemia. It is well known that any method of treating the disease, such as by radium, which will reduce the size of the spleen, will reduce also the number of white corpuscles, and coincidently improve the anemia and the general condition of the patient. It has been one of the traditions in medicine that a patient with splenomyelogenous leukemia from whom the spleen is removed will die from the operation.

My first experience with splenectomy in this disease was in a case in which a man had been examined, and treated for splenomyelogenous leukemia, in two of the largest hospitals in the country, in one for six months and in the other for four months. I removed the spleen, believing that the condition might be some obscure form of splenic anemia. The patient's blood did not become normal and he was never strong, but at least he was alive, when last heard from, seven and one-half years following operation. I hesitate to record this as a case of splenomyelogenous leukemia, since it was observed in the early days, when accurate differentiation was difficult. I have found that difficulty in diagnostic differentiation occurs much oftener at the bedside than in the textbooks.

The second patient on whom I performed splenectomy for splenomyelogenous leukemia was a woman, aged about 40, who had suffered from the disease for more than two years. She had been treated by roentgen ray, which was then just coming into use, and the usual number of unavailing internal remedies. True to form in such cases, irradiation eventually failed to do more than temporarily check the course of the disease. Ten days after splenectomy, the white cell count had dropped from over 300,000 to below 40,000, but it never became normal. The patient improved steadily, lived for approximately two and one-half years, and then died from intercurrent disease.

At about this time the use of the roentgen ray, and radium especially, was begun in the Mayo Clinic in the treatment of splenomyelogenous leukemia. In thirty-one cases, following the preliminary irradiation, which rapidly reduced the size of the spleen, splenectomy was performed. One patient died on the fourteenth day from accidental pulmonary embolism. Radium applied to the spleen reduces not only its size temporarily, but also the white cells. In one of our cases after irradiation, the white cells dropped from 500,000 to 3,500 before operation, but the drop was accompanied by toxic symptoms. We are now quite satisfied to reduce the white cells by radium to the vicinity of 30,000 before operation. Radium is of value in the treatment of splenomyelogenous leukemia, but it does not cure, and finally loses its good effect by producing connective tissue changes in the outer layers of the spleen, which encapsulate and protect the interior pathologic tissue from the rays.

In tracing patients splenectomized for splenomyelogenous leukemia, we found three who have been sufficiently free from the effects of the disease to carry on their work for a period of more than five years, and eight for more than three years. Others have had periods of temporary improvement of from one to two years, but all still show evidences of the disease. The operation of splenectomy in these cases is relatively simple, provided the patients have not had repeated and prolonged roentgen-ray or radium treatment; and I believe that in the more chronic cases, after due prepara-

tion by radium, splenectomy is worth while in selected cases.

CONCLUSION

In the light of clinical experience, the chronically enlarged spleen must be regarded as a menace to the well-being of its human carrier, and it rests with the physician to show why it should not be removed.

Besides the 255 cases of splenectomy referred to here, the spleen has been removed in the Mayo Clinic in ninety-three cases of splenomegalies due to micro-organisms, tumors and other conditions.[7]

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. CRILE AND MAYO

PROF. A. J. CARLSON, Chicago: I was surprised to hear Dr. Crile say that in goiter districts we should confine the giving of iodin to expectant mothers and to boys and girls at adolescence. Since the prevalence of simple goiter in certain regions seems to be associated with too little iodin in the water and food, the supplying of that iodin would seem to be useful to all people in all states of life. I am not aware that there is any higher incidence of "toxic" goiter nearer the seashore, where the supply of iodin is supposed to be physiologic. I question whether, at present, the term "fetal adenoma" is not begging the question. If we follow the thyroid gland from the fetus on, in what respect or at what stage can any one tell the difference in the gland or part of the gland that later develops into adenoma? Is it not true that almost any thyroid almost at any time may develop an adenoma, depending on some conditions that we do not know? Dare we assume that a "fetal adenoma" is the result of "orthogenesis," irrespective of fortuituous conditions after birth? The perennial discussion between internists and surgeons as to whether or not the toxic goiters should be excised seems to get us nowhere. Both internists and surgeons present what looks like good batting averages when each tell their own story. But let us give more attention to etiology and prevention, since a cure by either medicine or surgery is an uncertainty. Dr. Hektoen and I have developed a direct method of studying the thyroid hormone (thyreoglobulin) in blood and lymph. We find it in the thyroid lymph and thyroid vein blood in dogs. So far we have been unable to secure consistent evidence that the thyroid nerves increase or decrease the output of the thyroid hormone from the thyroid gland, but the work is not complete. I have also tried to determine in a more direct way whether Kendall's thyrotoxin really is the thyroid hormone. We have injected thyroxin into absolute cretin rabbits to see whether the administration of thyrotoxin in absolute cretinism can take the place of thyroid or thyroid extract. This seems to us necessary, since in practically no case of cretinism and myxedema in man can we be sure of absolute athyrodism. One particular thing that occurred in our cretins treated for a long time with thyrotoxin intravenously was the development of extreme arteriosclerosis. It would be premature to say now that thyrotoxin produces arteriosclerosis. The problem is complex. Protein split products in the material rather than the thyrotoxin may be responsible for the injury to the blood vessels. We do not usually class the spleen with the organs of internal secretion because evidence of hormone production in this organ is practically lacking. But, as in the case of many other organs, the physiologic light is coming largely from the clinical and the pathologic work rather than from experiments on normal animals. It is remarkable that the removal of the spleen in otherwise healthy animals produces practically no effect, except a slight temporary anemia, contrary to what we would expect if the spleen is an important organ for destruction of red cells, or if it produces some stimulant to the red bone marrow. It is well known that splenectomy usually results in improvement of the anemia in the so-called splenic anemia. Now Dr. Mayo reports improvement following splenectomy in the condition of polycythemia, the very opposite of anemia, and, still more remarkable, a distinct improvement in longevity, erythrocyte count and other clinical conditions in pernicious anemia, a disease, so far as our information goes, largely due to malfunction of the red bone marrow. These are points that we could not have guessed at, nor could they have been produced by experiments on normal animals. Apparently the spleen in some people is a Janus, now producing anemia, now polycythemia. Attempts have been made for years to improve pernicious anemia by the administration of spleen extracts, on the theory that the spleen produces something that stimulates the red bone marrow to the production of red cells. The results have been more than discouraging. Is it possible that pernicious anemia is merely the result of an hyperactive spleen?

DR. J. L. YATES, Milwaukee: What do these glands contribute or fail to contribute to resistance and defense which determines susceptibility to and recoverability from all diseases? Diseases are conflicts within living hosts between offense, initiating and disseminating irritations, and defense, focal and somatic reactions. Therapeusis includes two factors —reduction of irritation and augmentation of defense. Interest centers in augmenting defense by manipulating thyroid and spleen. Dr. Carlson said that too little is known about the hypophysis to consider it. Defense, Child has shown, varies with rates of oxidative metabolism. It consists of native tissue resistance reinforced by protection delivered in the blood. Protection includes an increase in normal formed and unformed blood elements plus antibodies, opsonins and the like, provoked by irritants. All are products of increased cell activities. Dr. Crile emphasized thyroid control of rates of somatic metabolism. Our medical forefathers believed in potassium iodid as an alterative. Apparently, administration of iodin increases resistance, not as an alterative; but, as Marine has shown, iodin aids thyroid to functionate. Four functions may be ascribed to the spleen: (1) participation in destruction of erythrocytes; (2) fabrication, possibly from destroyed erythrocytes, of a hormone, which, activated by liver, stimulates hematopoiesis in bone marrow; (3) formation of endotheliocytes and lymphocytes, and (4) elaboration of protective substances. The first two explain why splenectomy benefits patients suffering from hypersplenism (hemolytic jaundice) and hyposplenism (polycythemia, splenic anemia). Leake has demonstrated the efficacy of administration by mouth of extracts of spleen and bone marrow in secondary anemia. It is harmful in primary anemias because bone marrow is already exhausted. I believe that some benefits of splenectomy are unappreciated. Dr. Mayo referred to types of syphilis simulating splenic anemia and the improvement subsequent to splenectomy. Certain types of Hodgkin's disease and cancer progress so gradually that resistance is dissipated without being stimulated to the overactivity essential to recovery. If timely splenectomy be performed on suitable patients, compensatory overactivities in liver, lymph glands and bone marrow afford an effective amount of resistance otherwise unobtainable. First suggestions of correlated influence of thyroid and spleen on defense came from Bardeleben (1844), who held that life was impossible after removal of the thyroid and the spleen. Limited personal observations on rabbits and dogs after excision of both spleen and thyroid indicate that resistance to infection is reduced and that prolonged life, especially in carnivora, is exceptional.

DR. W. D. HAGGARD, Nashville, Tenn.: Dr. Crile has described the extreme condition in which patients with exophthalmic goiter may find themselves. Many of them are almost moribund, and anything done to them surgically almost kills them. What is the matter with those patients? We have had a great many theories to explain the phenomenon of the exophthalmic goiter syndrome. It is something that renders them very desperate. Kendall has come closer to it than any one else, in that he has shown that in the molecule of thyroxin there is a deficiency in the atom of iodin. We knew for a very long time that all the iodin in the body was handled by the thyroid gland, and the lack of this iodin atom seems to be the essential thing in producing this disease. It is almost, in a sense, an iodin deficiency

7. The statistics include all splenectomies performed in the Mayo Clinic up to April 1, 1924.

disease. Iodin is the governor on the metabolic engine. If it is lacking, conditions must be corrected before operation is undertaken. Dr. Crile has described the measures he has worked out to prepare these patients for operation, but we must do something for this deficiency of iodin. The administration of compound solution of iodin, 10 drops at bedtime for ten days, will absolutely transform these acutely toxic cases. The patient who is in crisis with vomiting or diarrhea, great emaciation and marked prostration, will in a few days become tranquil. The pulse rate will go down from 20 to 50 points, and the metabolic rate will recede. Under those circumstances, the technic that Dr. Crile has worked out can be employed and the death rate will be diminished to the vanishing point. Not only that, the medical death rate will be diminished because the medical death rate for these acute conditions is very high. Plummer reports that he has had no medical death in eight months, whereas, before using compound solution of iodin, be observed about seventy-five deaths a year. The most striking feature of Dr. Mayo's paper was the wonderful way in which purpura hemorrhagica patients are relieved and cured, promptly and permanently by splenectomy.

DR. E. M. HANRAHAN, Baltimore: From the point of view of the surgeon, the problem of splenic disorders reduces itself to the question, "When should splenectomy be performed"? The answer lies in the comparison of the natural history of the disease both with and without medical treatment, and the results seen in similar conditions after operation. We usually hear of end-results only after splenectomy, and the greater part of these reports have dealt with the results over too short a period to give the true value of the operation. There is beginning to develop what might be called a surgical classification of splenic disorders, which is based on the end-results seen after splenectomy. This classification may be represented in three groups: First are those diseases in which we see remarkable results following the operation, best exemplified by purpura hemorrhagica or essential thrombocytopenia. Second are those cases in which we usually see a clinical cure. In this group we have hemolytic jaundice and splenic anemia or Banti's disease. In the third group, I would place pernicious anemia, a disease with apparently more or less splenic involvement, in which I do not feel that splenectomy is ever indicated. I would take exception to Dr. Mayo's inclusion of this disorder with hemolytic jaundice and splenic anemia, as a study of the end-results shows that we are dealing with quite different processes. I have compared the results in patients with pernicious anemia not subjected to operation between 1913 and 1918 with ten patients operated on. The average duration of life in the ten cases was fourteen months. The average duration of life in the cases in which the spleen was not removed was eighteen months. On the basis of this study, I feel that pernicious anemia should not be included among those diseases in which splenectomy is always to be considered. In this third group I would place the leukemias, both myeloid and the lymphoid, in which splenectomy is almost contraindicated. The decision for splenectomy must be based on a comparison of the natural history of the disorder with the history of cases treated with splenectomy. In this comparison must be considered the operative mortality, which varies from 10 to 25 per cent. Dr. Mayo, I think, is the one man who has been responsible for the marked reduction in operative mortality in this operation. I feel from a recently completed study of the end-results in thirty-five cases that splenectomy offers least in those cases of hemolytic jaundice or splenic anemia which show a tendency toward pernicious anemia, and that it offers the most in those cases which show the least signs of uncompensated blood destruction. Against this we must weigh the chances of cure with the high operative risk.

DR. FRANK H. LAHEY, Boston: There are a few points in which I have been very much interested. One is the diagnosis of thyroid disease. I have in the past had difficulty in differentiating the so-called neurocirculatory asthenia cases. I have found that exophthalmic goiter may exist in the entire absence of an enlarged gland or even in the presence of a diminutive gland. I believe it is in this type that we should make a most critical study as to whether the tachycardia is of thyroid or nonthyroid origin. Our own experience is that if it is of nonthyroid origin, the true basal metabolic rate is not elevated. It is essential that the true rate be obtained by repeated tests if necessary. I believe that the mortality following thyroid operations has been lowered not by the anesthesia but by the preoperative study of the cases, the selection of the operation and the postoperative care. In our clinic the medical mortality has always been much higher than the surgical mortality. We have now operated on 2,200 thyroid patients with an operative mortality of 0.9 per cent. and a patient mortality of 1.3 per cent. In our locality goiter is not endemic, and the percentage of the various types is: primary hyperthyroidism, 46; secondary hyperthyroidism, 26; nontoxic goiter, 28. Since the medical mortality is higher than the surgical, and since there is often undoubtedly a cardiac complication (auricular fibrillation and decompensation), then our duty is to get these patients well by the method that will do it the most quickly, the most completely, the most certainly, and that is surgery. It takes three months to ascertain whether the roentgen ray will cure, and within three months the average hyperthyroid patient can be restored to health by surgery, so that I think surgery is by all means the method of choice. The roentgen ray shows a much higher percentage of failures and it does not effectively combat the disease. It is impossible in the roentgenogram to tell the type of thyroid tissue with which one is dealing, and so just how much to leave behind. The question of compound solution of iodin is very interesting. I think we owe Dr. Plummer a great deal for the development of its use in primary hyperthyroidism. However, we must bear in mind that there is no longer fear of table deaths in thyroid clinics, but it is the postoperative reaction that kills the patient. The use of compound solution of iodin has made it possible to eliminate, it is said, many ligations. Ligations have had a great deal to do with lowering the mortality of thyroid operations through their being made use of as minor trial procedures, and if we give up these trial procedures, because of the use of compound solution of iodin, we shall lose one of the real life-saving measures in thyroid surgery. I believe we must associate the clinical picture of the patient when we first see him with his condition after he has been rested in bed, and if there is any doubt, treat by ligation or hemithyroidectomy, because, after all, the real value of preliminary operation in hyperthyroidism is not only the temporary benefit to the patient but also his psychic adjustment to the operations and the knowledge of how great the reaction to the operative procedure may be. We know that if he will stand one ligation, he will stand another; if he will stand removal of one side of the gland, he will stand removal of the whole gland. After all, the important thing is that the patient get through safely; and if it is necessary to do an occasional extra operation which might not be necessary, that is the side to err on, and not do too much and regret too late not having made use of a lesser procedure.

DR. J. M. BLACKFORD, Seattle: During 1911 and 1912 I had opportunity to do many necropsies on exophthalmic patients. In 1916 I made a study of all the necropsy cases at Rochester and discovered a surprising fact. There were almost as many medical deaths as surgical. Up to 1912, ligations had not been done, or at least not with frequency. Further, up to that time the internist had not realized that the patient critically ill from exophthalmic goiter crisis should not be dealt with surgically. The recognition of these fundamental defects in judgment as to when and how to operate were brought about by the fact that before 1912 in patients under 25, suffering from exophthalmic goiter, the mortality from surgical procedures was 27 per cent., and the gross surgical mortality was 3.6 per cent. During 1913, ligation came into extensive use; also better judgment in not operating on the critically ill patient in crisis. The surgical mortality rate immediately dropped to 2.5 per cent. for all ages, and has stayed at approximately that figure until two years ago. Within the last few weeks I reviewed this matter of iodin in the treatment of exophthalmic goiter. Dr. Haggard spoke of the importance of the use of iodin, but has not gone into detail as to what it is supposed to do. It seems that the

use of compound solution of iodin definitely and almost immediately destroys symptoms of dysthyroidism, but apparently does not materially affect the straight hyperthyroidism which goes along with exophthalmic goiter. Those patients in delirium, vomiting, diarrhea, extreme emaciation and psychic upsets, that make them entirely irresponsible, occasionally with mania, within from twenty-four to forty hours after getting a large dose of compound solution of iodin come back to a state of mind and health that is an entirely different picture. Dr. Plummer was very emphatic in stating that straight hyperthyroidism is not greatly affected by iodin, and hence iodin is not a cure for exophthalmic goiter, and will harm the patient with a toxic adenoma. Two other very striking things were brought out. Dr. Boothby told me that they had cut down the number of ligations from being nearly a routine procedure until this year he thought they would not ligate more than 8 per cent. of cases of exophthalmic goiter. They are doing a primary thyroidectomy in a very large proportion. Medical deaths, which in my day varied from eighteen to twenty patients a year, in spite of the fact that they had then a smaller number of patients, have decreased until now the medical death rate approaches the vanishing point. The surgical death rate has been lowered so far as to make it a relatively safe procedure. They have gone along for several months without mortality. The gross mortality (combined medical and surgical) was 5.6 per cent. up to 1922. The last year this gross mortality has been reduced to less than 1 per cent. These results prove that we have a most valuable method of treatment in compound solution of iodin for the crisis of exophthalmic goiter. Not all patients with exophthalmic goiter are benefited by iodin. A patient who has carried an exophthalmic goiter for a number of years finally reaches a stage at which there is something that possibly approaches a straight low grade hyperthyroidism. These patients, in general, do not show anything like the remarkable improvement, and some of them show no improvement, from the use of compound solution of iodin. A certain percentage of patients with exophthalmic goiter also have toxic adenoma. Further, it is occasionally impossible to differentiate clinically the toxic adenoma from exophthalmic goiter. A patient may have both diseases. If adenomas are suspected, iodin must be used very cautiously. The protection afforded by compound solution of iodin is very rapidly lost after the medication is discontinued.

DR. GEORGE W. CRILE, Cleveland: Professor Carlson said that he thought that logically the adult population should be as much in need of the iodin administration as the children. We are waiting for the physiologists to tell us definitely what is the exact function of the thyroid. In view of our present uncertainty, it would seem best to stick to the old clinical attitude; viz., that a deficiency should be established before iodin is given, since, as has been pointed out, iodin administration is very often followed by bad results, especially when used for the wrong type of goiter. I hope that the use of compound solution of iodin will eventually prove to be of as much value as is hoped for. We always give *2* grains (0.13 gm.) of thyroid extract the night before a thyroidectomy, and *2* grains on the morning of the thyroidectomy. Following operation, the patient often has a peculiar look which all our group recognize. In such cases we give thyroid extract and thyrotoxin two or three days after operation. There is temporary deficiency that we have always tried to meet. Whether or not Dr. Plummer by the use of compound solution of iodin will make these patients far more safe remains to be seen.

DR. WILLIAM J. MAYO, Rochester, Minn.: Most of the so-called diseases more or less associated with the spleen are not true diseases but syndromes, the names being merely hooks on which to hang a miscellaneous assortment of kindred dyscrasias, because we do not know just what else to do with them. As we learn to differentiate better, we change the nomenclature. In the later and incurable stages we hold definite opinions, and the death of the patient substantiates the prognosis perhaps rather than the diagnosis. I quite agree with Dr. Hainaford that we cannot expect to cure pernicious anemia or splenomyelogenous leukemia by splenectomy; but the operation under proper conditions is reasonably free from risk, is palliative, and in some of the early, or perhaps better, less well defined cases, the patients live for years and are able to work. As nearly as I can make out, the spleen is a kind of an old fool that acts as an agent of some as yet little understood pathologic processes elsewhere in the body, and when set in motion does not know when to stop. It goes ahead doing something it ought not to do and keeps it up until the patient dies. When the spleen is once stimulated to action, it develops a pathologic condition of its own which is not amenable to corrective treatment. Splenectomy under these circumstances removes a rebellious agent, but does not necessarily cure the original disease. Professor Carlson speaks about cooperation between the physiologist and the clinician. He visited us two years ago, and his suggestions at that time with regard to this and many other matters stimulated us greatly. We appreciate visitors of this type at the Mayo Clinic, and would like to have more of them. We hope that Professor Carlson may come again. With reference to the spleen, I am reminded of the old story of the professor questioning a student concerning its function. The student after deep thought replied, "I did know, but I have forgotten," to which the professor added, "What a pity, because you are the only one who ever did know the function."

EXPERIMENTAL STUDIES ON YELLOW FEVER IN NORTHERN BRAZIL

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Yellow fever is known to have existed in Brazil [1] from the beginning of commercial development of the country until it was practically eradicated by the vigorous antimosquito campaigns of Oswaldo Cruz, Ribas and Lacerda. In certain limited areas, in the states of Ceará, Bahia and Pernambuco, the disease was still present during 1922 and 1923.

While there was no reason to regard the yellow fever of Brazil as different from that occurring elsewhere, the micro-organism isolated from cases of yellow fever in Ecuador,[2] Peru,[3] and Mexico [4] had not been experimentally demonstrated as the cause of Brazilian yellow fever. Hence, an investigation into the etiologic relation of *Leptospira icteroides* to cases occurring in Brazil was undertaken by a joint commission of Brazilian and American workers, the latter having received an invitation from Dr. Carlos Chagas, director of the

1. Boyce, R.: Yellow Fever and Its Prevention, New York, E. P. Dutton & Co., 1911, p. 11.

2. Noguchi, Hideyo: J. Exper. Med. **20**: 547, 565, 585 (June) 1919; **30**: 1, 9, 13, 87, 95 (Aug.) 1919; **30**: 401 (Oct.) 1919; **33**: 135, 159 (Feb.) 1920; **32**: 381 (Oct.) 1920; **36**: 357 (Sept.) 1922. Cohn, A. E., and Noguchi, Hideyo: Ibid. **33**: 683 (June) 1921. Noguchi, Hideyo; and Pareja, Wenceslao: Prophylactic Inoculation Against Yellow Fever, J. A. M. A. **76**: 96 (Jan. 8) 1921.

3. Noguchi, Hideyo; and Kligler, I. J.: J. Exper. Med. **33**: 239, 253 (Feb.) 1921.

4. Noguchi, Hideyo; and Kligler, I. J.: J. Exper. Med. **32**: 601, 627 (Nov.) 1920. Perez Grovas, P.: Experimental Transmission of Yellow Fever, J. A. M. A. **76**: 362 (Feb.) 1921. A strain of Leptospira icteroides was also isolated by Dr. Thomas J. Le Blanc in Vera Cruz in 1920.

Departamento Nacional de Saúde Publica, to make an expedition to Brazil under the auspices of the International Health Board of the Rockefeller Foundation. The experiments covered the period from Nov. 29, 1923, to Feb. 24, 1924, and were carried out at the Oswaldo Cruz Institute of Bahia, the staff of the institute, the faculty of medicine, and the state and federal departments of health being represented on the commission.

The special equipment for the work was taken from the Rockefeller Institute, including microscopes, sterile glassware of all kinds, filters, sterilizers, incubators and iceboxes. Four hundred guinea-pigs were also taken from New York, as well as fifty rabbits to furnish serum for culture medium, four *Macacus rhesus* monkeys, and three baboons. About 100 marmosets, three "prego" monkeys (*Cebus macrocephalus*) and a black spider monkey (*Ateleus ater*) were purchased in Bahia.

The plan of the work involved (1) the isolation of *Leptospira icteroides;* (2) the reproduction of yellow fever in lower animals; (3) the demonstration of the Pfeiffer reaction for *Leptospira icteroides* in the serum of persons recovered from yellow fever, and the absence of such a reaction for *Leptospira icterohaemorrhagiae;* (4) the proof of the filtrability of the Brazilian strains of *Leptospira icteroides,* and (5) the determination of the protective property of the anti-icteroides immune serum (horse) prepared by means of other stains of *Leptospira icteroides* against infection with the Brazilian strains.

ISOLATION OF LEPTOSPIRA ICTEROIDES FROM CASES OF YELLOW FEVER

About the middle of December, it was learned that a disease believed by a local physician to be yellow fever had been prevalent for several weeks in an interior town of about 3,000 inhabitants, Villa Bella das Palmeiras. There was no railroad connection with Bahia, and the journey to Palmeiras required one day by steamer, one by train, and four on horseback. Drs. Vianna and Bião were appointed by Dr. Sebastião Barroso, chief of the Serviço de Saneamento e Prophylaxia Rural, to make an expedition to Palmeiras. They took with them equipment for making examinations for malarial parasites, reagent for clinical tests for yellow fever, sterile syringes for drawing blood, and eighty hermetically sealed tubes of "leptospira" culture medium. The distance and character of the journey made the transportation of experimental animals out of the question.

The medium prepared for the expedition was modified somewhat because of the conditions.[5] The rabbit hemoglobin was omitted, since it undergoes rapid change at ordinary or higher temperatures, and distilled water was substituted for isotonic saline solution in order to produce laking of the patient's blood. The tubes were protected from the intense tropical sun by being kept partly submerged in water and covered with green leaves during the journey, both before and after inoculation.

The diagnosis of yellow fever in Palmeiras was confirmed by Drs. Vianna and Bião, and cultures were made from the blood of one fatal and four nonfatal cases, six tubes of medium being inoculated in each instance with quantities of blood in gradually decreasing amounts from 2 c.c. to a few drops. The tubes were brought back by Dr. Vianna, Jan. 4, 1924, and were immediately submitted to dark field examination by several members of the commission. There had been a mold or bacterial invasion in several instances, but the majority of the tubes were free from contamination. A rich growth of *Leptospira* was found by Dr. Vianna in one of the tubes from Case 3, and somewhat later a positive finding was reported by Dr. Martins in one of the Case 5 tubes. *Leptospira icteriodes* was isolated, therefore, in two of the five cases studied, notwithstanding the unfavorable conditions under which the material had been transported.

Dr. Bião had remained in Palmeiras, and, after Dr. Vianna's departure, made cultures from four other cases.[6] The tubes were kept in Palmeiras much longer than the first set, and when Dr. Bião finally reached Bahia with them, most of them were contaminated, and the *Leptospira* could not be detected in any instance.

PATHOGENICITY AND BIOLOGIC PROPERTIES OF THE BRAZILIAN STRAINS OF LEPTOSPIRA ICTEROIDES

The original cultures of the Palmeiras strains showed very low virulence for guinea-pigs, and were even less pathogenic for marmosets.[5] The guinea-pigs used for the inoculations were those of suitable age taken from New York. The Case 3 strain produced fatal infection in only three of eight guinea-pigs, and there was almost always a secondary infection with the paratyphoid bacillus in fatal instances. A second passage yielded a greater number of fatal infections. By the third passage, the virulence of the strains for guinea-pigs had been increased to such an extent that 0.001 c.c. of a mixture of blood and organ suspension representing both strains killed guinea-pigs in eight days; that is, the strains had become many thousand times more virulent.

The essential features of the lesions induced by the Palmeiras strains were hemorrhages into the lungs and gastro-intestinal mucosa, nephritis, and fatty degeneration of the liver. Jaundice was always present in definite infections; in the milder forms of the disease, a febrile reaction, beginning after a period of from four to six days and persisting one day or longer, was the only objective symptom, but positive results were secured by transferring to other guinea-pigs blood of suspensions of organs taken during the febrile stage. The demonstration of *Leptospira icteroides* in such materials could rarely be made, and even in the case of very marked infection, *Leptospira* was seldom found. The success of cultivation was also very variable and never readily accomplished.

SUSCEPTIBILITY OF MONKEYS TO THE BRAZILIAN STRAINS OF LEPTOSPIRA ICTEROIDES

Macacus rhesus had proved resistant to the strains of *Leptospira icteroides* isolated from yellow fever in Guayaquil, but the Colombian variety of marmosets had succumbed to infection, with pronounced symptoms and lesions.[7] The Brazilian marmosets proved unsatisfactory for experiment, being not only relatively insusceptible to *Leptospira icteroides,* but nonresistant to spontaneous bacterial infections. Reproduction of yellow fever was obtained in a striking way, however, in two native monkeys (*Cebus macrocephalus*).

Two African baboons, taken from New York, and three Amazon monkeys purchased in Bahia (two of the

5. A detailed report of the work of the Joint Commission for the Study of Yellow Fever in Brazil has been published as Monograph 20 of the Rockefeller Institute for Medical Research, and may be obtained free of charge by application to the International Health Board of the Rockefeller Foundation, 61 Broadway, New York City. For description of culture mediums, protocols of experimental animals, full histologic reports, and illustrations, the reader is referred to the monograph. A separate report of the Pfeiffer reactions is also to be published by Dr. Octavio Torres, and will contain clinical histories of each convalescent whose serum was tested.

6. The diagnosis in these cases was confirmed by Dr. Elizier Studart.

7. Noguchi, Hideyo: J. Exper. Med. 29: 585 (June) 1919.

species, *Cebus macrocephalus* and one black spider monkey (*Ateleus atar*) were inoculated, each with 1 c.c. of a mixture of rich cultures of the second passage of the Palmeiras strains. The baboons had a rise of temperature for a few days, but otherwise remained well. The spider monkey also had fever on the third day but no other symptoms. Both the *Cebus* monkeys developed typical symptoms of yellow fever after an incubation period of sixty hours. The first febrile period persisted for about twelve hours; there was a brief remission, then a rise to from 105.8 to 106 F. on the fourth day, after which the temperature rapidly fell. One of the animals was injected on the fourth day with 15 c.c. of anti-icteroides immune horse serum, which had been prepared with the Ecuadorean, Peruvian and Mexican strains of *Leptospira icteroides*, and recovered promptly. The other gradually became weak and listless and refused food (food taken during the early period of the fever had been vomited). Later it fell to the floor of the cage and seemed delirious, offering slight resistance to handling. Coma developed subsequently, and death occurred seven days after the first rise of temperature. The findings at necropsy were typical:[8] faint general jaundice, with distinct yellowness of sclerae and ear lobes; congested gums; yellow, fatty liver; "coffee-ground" stomach contents; melena; subcapsular hemorrhage in the kidney; empty bladder (anuria). Histologic study (by Dr. Muller) of the organs showed marked fatty infiltration of liver, kidneys, and heart muscle, the fat being present in the form of very fine, closely packed globules. The cells of the convoluted tubules of the kidney were in an advanced stage of cloudy swelling and simple necrosis. Sections of the stomach stained by Perl's Prussian-blue method showed hemosiderin in patches in the surface epithelium, confirming the presence of blood in the "coffee-ground" contents of the stomach.

Suspensions of liver and kidney were negative for *Leptospira* by dark field examination, and no growth was obtained on culture medium. Sections of the organs stained by Levaditi's method of silver impregnation revealed no *Leptospira*.

Six guinea-pigs simultaneously inoculated with 0.2 c.c. of the same culture as controls developed typical symptoms and died in from five to seven days.

VIRULENCE OF BRAZILIAN STRAINS FOR YOUNG DOGS

Early in the course of the first transmission experiments of one of us [7] in Guayaquil, it had been found that young dogs (6 weeks old) developed typical and usually fatal yellow fever when inoculated with sufficiently large quantities of virulent material from guinea-pigs infected with *Leptospira icteroides*. Later experiments in puppies with strains of *Leptospira icteroides* from Mexico and Peru yielded similar results.[8] The experiments to determine the pathogenicity of the Brazilian strains for young dogs were carried out at the Rockefeller Institute after the return of the International Health Board Commission from Brazil.

Two pups of a litter about 8 weeks old were inoculated, one intraperitoneally, and the other subcutaneously, each with 5 c.c. of a rich culture of Brazilian Strain 5. On the morning of the seventh day after inoculation, one of the animals was found dead, and the other was comatose. Both were deeply jaundiced. The second animal died in the afternoon of the same day. At necropsy, "coffee-ground" material was found in the stomachs of both animals, and there were hemorrhages in both stomach and intestines. The livers were pale and mottled with lighter colored patches. The bladder was completely empty in one animal (anuria) and in the other practically so. In one instance the kidneys were large and extensively hemorrhagic, in the other pale. Histopathologic study (by Dr. Muller) revealed marked fatty infiltration of liver and kidneys. The trabeculae of the liver were distorted; the liver cells were swollen, granular and vacuolated, and numerous mitotic figures were present; there were hemorrhages and many polymorphonuclears in the sinuses. The kidneys showed marked cloudy swelling and hemorrhages. In the stomach, hemorrhages were present in the mucosa and submucosa.

Sections stained by Levaditi's silver impregnation method revealed the presence of a few fragmented *Leptospirae* in liver and kidney, and the organisms were more numerous in the muscularis of the gastro-intestinal tract.

FILTRABILITY OF THE BRAZILIAN STRAINS

It had already been shown [9] that *Leptospira icteroides* passes through the pores of Berkefeld filters, and it was desirable to demonstrate this property also in the case of the Brazilian strains.

A 1:100 dilution in isotonic saline solution of a small quantity of the original culture from Case 5 was divided and portions filtered separately through Berkefeld V and N filters. Neither filtrate showed *Leptospira* by dark field examination, but growth was obtained in one of the six tubes of leptospira medium inoculated with the N filtrate and in five of the six tubes inoculated with the V filtrate. Definite infection was induced in guinea-pigs by inoculation of the cultures obtained from the filtrates.[8]

IMMUNOLOGIC STUDIES

Pfeiffer Reaction.—A Pfeiffer reaction which had been carried out in April, 1923,[10] with the serum of an American who had had yellow fever in Fortaleza, Ceará, sixty-five days previously, had indicated that the etiologic agent in this case of yellow fever in Brazil was identical with the strains of *Leptospira icteroides* isolated elsewhere. At the time when our work in Bahia was begun, no cases were available for isolation experiments, but an excellent opportunity was offered to test the immunologic properties of the serums of persons recovered from yellow fever in relation to the strains of *Leptospira icteroides* obtained from cases of the disease in Ecuador, Mexico and Peru. Through the cooperation of the physicians [11] who had treated the cases, we obtained nine serums from residents of Bahia, chiefly foreigners, who had had yellow fever during the year 1923. Parallel reactions were carried out with three strains of *Leptospira icterohaemorrhagiae*, two of American,[12] and one of Ecuadorean [13] origin. The serums of four persons who had never had yellow fever were tested simultaneously as controls.

All the serums from yellow fever convalescents gave a positive Pfeiffer reaction, and all the normal serums a

8. Noguchi, Hideyo: Lancet **202**:1185 (June) 1922.

9. Noguchi, Hideyo: J. Exper. Med. **30**:13 (Aug.) 1919. Nichols, H. J.: Personal communication to the author. Dieterich, F. H.: Am. J. Trop. Med., to be published.

10. Noguchi, Hideyo: Ann. J. Trop. Med. **4**:131 (March) 1924.

11. Drs. Fernando Luz, Alberto do Rio, Dias de Moraes, Vidal de Cunha, and Eduardo Aranjo.

12. Noguchi, Hideyo: J. Exper. Med. **25**:755 (May) 1917. Wadsworth, Augustus; Langworthy, H. Virginia; Stewart, F. Constance; Moore, Anna C., and Coleman, Marion B.: Infectious Jaundice Occurring in New York State, J. A. M. A. **78**:1120 (April 15) 1922.

13. Noguchi, Hideyo: J. Exper. Med. **30**:95 (Aug.) 1919.

negative Pfeiffer reaction with *Leptospira icteroides*, while *Leptospira icterohaemorrhagiae* was entirely unaffected by either the convalescent or the normal serums.[8]

As soon as the Palmeiras strains had been isolated, Pfeiffer reactions were carried out with these strains and several of the Bahia convalescent serums. All the Bahia serums gave a clearly positive Pfeiffer reaction with the Palmeiras strains.

When Dr. Bião returned from Palmeiras, February 1, he brought back four serums from persons who had had yellow fever two to six weeks previously, two of these being from the cases from which the Palmeiras strains had been isolated. All these serums gave a positive reaction with *Leptospira icteroides* from the Ecuadorean, Peruvian and Mexican sources, as well as with the homologous strains. A specimen of serum obtained a little later from a clinically clear case of yellow fever occurring in Conceição de Almeida, two days' journey from Bahia, also gave a positive Pfeiffer reaction with all the *Leptospira icteroides* strains.

The conclusion is warranted, therefore, that these yellow fever cases in Brazil were etiologically identical with those occurring in Ecuador, Peru, Mexico and Colombia.[10]

DETERMINATION OF POTENCY OF ANTI-ICTEROIDES IMMUNE HORSE SERUM

It has already been noted that one of the Brazilian monkeys (*Cebus macrocephalus*) developing typical symptoms of yellow fever following the inoculation of the mixture of the Palmeiras strains was saved by the administration of anti-icteroides serum on the fourth day of illness. The immune serum is that obtained from horses which have been immunized for several years with the various strains (from Guayaquil, Mexico and Peru) of *Leptospira icteroides;*[11] it had been drawn two months previously, transported to Bahia in the refrigerator (4 C.) and kept at about 15 C. after arrival there.

The potency of the serum was tested[5] in guinea-pigs infected with a mixture of virulent blood and organ suspension of Palmeiras Strain 3. Each of ten guinea-pigs received a dose representing 1,000 minimal lethal doses, and varying quantities of the immune serum were injected within thirty minutes. The minimum quantity of the serum tested (0.0001 c.c.) protected guinea-pigs against 1,000 minimal lethal doses; that is, 1 c.c. of the serum was able to neutralize at least 10,000,000 minimal lethal doses. Experiments in treating infected guinea-pigs at various stages of the infection had to be abandoned, because the supply of suitable animals had been exhausted.

SUMMARY

Two strains of *Leptospira icteroides* have been isolated from two of nine cases of yellow fever in Villa Bella das Palmeiras, an interior town in the state of Bahia, Brazil, by inoculation of suitable culture medium with blood drawn on the first and second days of illness, respectively.

The characteristic pathogenicity of the Brazilian strains of *Leptospira icteroides* was established by experiments with guinea-pigs taken from New York. The original cultures directly isolated from the blood of patients showed a very low virulence for guinea-pigs, but by timely passage to fresh animals during the height of fever, the virulence of the strains had been increased several thousandfold in the third generation. The essential features of the infection were jaundice, hemorrhages into the lungs and gastro-intestinal mucosa, nephritis, and fatty degeneration of the liver. *Leptospira icteroides* was rarely demonstrable in the materials used for transmission, and the success of cultivation was variable and never readily accomplished.

Two monkeys of the species *Cebus macrocephalus*, when inoculated with the Brazilian strains of the second passage, developed typical symptoms of severe yellow fever. One recovered after having received anti-icteroides immune serum (horse) on the fourth day of illness; the other died on the seventh day. Necropsy revealed the pathologic changes typical of human yellow fever, and histologic study of the organs demonstrated the presence of the characteristic fatty degenerative changes of liver and kidney. Three African baboons and a monkey of the species *Ateleus ater*, similarly inoculated, developed slight fever on the third or fourth day, but otherwise remained well.

The Brazilian strains of *Leptospira icteroides* induced in young dogs a fatal infection, characterized by jaundice, hemorrhages (principally into the gastro-intestinal tract, with black vomit), and intense nephritis. Fatty degeneration of liver and kidney was marked. Dark field examination and culture were negative, but *Leptospira* was demonstrated in tissues stained by Levaditi's method of silver impregnation.

The filtrability of the Brazilian strains was established by the recovery of *Leptospira icteroides* in a culture medium inoculated with Berkefeld V and N filtrates of the original culture of Strain 5. Definite infection was induced in guinea-pigs by inoculation of the cultures obtained from the filtrates.

Serums from nine persons who had had yellow fever in Bahia from five to ten months previously, four serums from Palmeiras cases two to six weeks after their attack of the disease, and one serum taken on the fourteenth day of illness from a yellow fever patient in Conceição de Almeida, Bahia, all gave positive Pfeiffer reactions when tested with strains of *Leptospira icteroides* from sources in Ecuador, Mexico and Peru, as well as with the Brazilian strains. Parallel reactions with *Leptospira icterohaemorrhagiae* were uniformly negative. Several normal serums tested in each instance as controls gave negative reactions with both organisms. The identity of the yellow fever occurring in Ecuador, Mexico, Peru, Colombia and Brazil was thus established.

One ten thousandth cubic centimeter (0.0001 c.c.) of the anti-icteroides serum prepared in horses with strains of *Leptospira icteroides* of Ecuadorean, Mexican and Peruvian origin protected guinea-pigs against 1,000 minimal lethal doses of a Brazilian strain in the form of a suspension of blood and organs from an infected guinea-pig.

14. Noguchi, Hideyo: Prophylaxis and Serum Therapy of Yellow Fever, J. A. M. A. 77: 181 (July 16) 1921.

Outpatient Department Health Agency.—The outpatient departments today are placing increasing emphasis on preventive measures and on health teaching. Social service departments and special classes already exist. There are being established clinics for pregnant women, for well babies, for preschool children, and facilities for the periodic examinations of well adults. The outpatient department is becoming an active community health agency. It is becoming a part of the forward looking movement which takes account of the environmental aspects of health and disease, as well as the manifestations of a pathologic process in the individual, and which strives to conserve health and prevent disease.—Smith, R. M.: *Hosp. Social Service* **10**:26 (July) 1924.

VISCERAL DISEASE

DUE TO BACTERIAL INFECTION OF APPARENTLY NORMAL UPPER RESPIRATORY TRACT *

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The search for foci of infection is commonly a quest for pus or diseased tissue visible to the naked eye or disclosed by the roentgen ray or some special physical method. Inability to elicit such evidence leads to the conclusion that there is no focus of infection in the parts examined. Such conclusion, however, ignores the possibility of persistent localized infection in the absence of suppuration or other gross tissue change.

It is well known, of course, that pathogenic micro-organisms can live on what appears to be a healthy mucous membrane without infecting the carrier; but it is not so generally recognized that such organisms can infect their host without producing at their site pathologic changes that can be seen.

In particular, the nares, the rhinopharynx, the fauces, and the tonsillar fossae, even after complete tonsillectomy, may be sites of focal infection in the absence of visible alteration of structure; that is mucous membranes with no noticeable macroscopic lesion may harbor micro-organisms, pathogenic for the patient, which live and multiply in them, and give rise to disease in neighboring or distant tissues and organs.

An ordinary bacterial culture, however, gives no information as to whether or not the organisms found are really infecting the patient. As a matter of fact, the infecting organisms may fail to grow in ordinary culture mediums, because they may be in such small numbers, compared with other organisms present at the same site but not infecting the patient, that they are overgrown and their growth is inhibited by these noninfecting germs. The latter may, indeed, be of pathogenic varieties; but the point is that, at the moment, they are not pathogenic for the person harboring them. As to them, he is a carrier only. As to the others, he is a subject of infection. It is necessry, then, to distinguish accurately between organisms that the subject carries and which for him are nonpathogenic—infestive merely—and organisms that are actually pathogenic for him, and with which, therefore, he may be said to be infected. This distinction is made by a special method of culture, which I therefore term pathogen-selective culture.

THE PATHOGEN-SELECTIVE CULTURE

A swab from the part or parts to be studied is lightly smeared on the bottom of a sterile, empty test tube, into which is then placed from 3 to 5 c.c. of fresh, whole, coagulable blood obtained from the patient's vein. After twenty-four hours' incubation, a drop of this blood is plated and the organisms that grow up on the plate are identified.

Parallel with this selective culture, an ordinary culture is made on Löffler's or other appropriate medium.

Profuse growth of any organism cultivated by the selective method is evidence that the patient's blood possesses little or no bactericidal or bacteriostatic power against that organism, and hence that it is highly pathogenic for him. Slight growth indicates the presence of considerable bacteriostatic power in the patient's blood against the organism in question, and hence slight pathogenicity of this organism for the patient tested.

Absence from the selective culture plate of an organism present in the culture taken in the ordinary way, indicating that this organism has failed to grow in the patient's whole blood, evidences possession by that blood of sufficient bacterial power to kill or inhibit it. Hence, we infer that the organism in question is nonpathogenic for the patient, at the time of the test.

To make sure of results, the cultures should be studied by a trained bacteriologist. Technicians and physicians inexpert in bacteriologic work may readily err.

The method, of course, has limitations. The reaction is, to a certain extent, quantitative, and is thus affected by the relative proportion of blood and bacteria engaged. When a relatively large number of organisms, nonpathogenic to the patient, are planted in a relatively small quantity of blood, it is conceivable that the amount of bactericidal substance present may not be sufficient to destroy all of them; and, if only a few escape, they may multiply rapidly in the absence of any restraining influence. Conversely, if relatively few organisms are planted in a relatively large quantity of blood that is but slightly inimical to them, it is possible that enough of the restraining substance might be present to prevent their growth entirely.

These possibilities must be taken into account.

I have used the pathogen-selective culture on 169 patients; as many as fourteen separate cultures having been made on one patient.

The conclusion that a given organism is pathogenic to a person in whose whole, coagulable blood it grows and multiplies in vitro, and nonpathogenic to one whose blood destroys it or inhibits its growth, is based on certain experiments performed in the Mastbaum Research Laboratory of the Jewish Hospital, Philadelphia, by George D. Heist, Solomon Solis-Cohen and myself,[1] which were reported some six years ago, and which since have been confirmed by other investigators, Matsunami and Kolmer,[2] Bull and Bartual,[3] Black, Fowler and Pierce,[4] Smiley,[5] and Robertson and Sia.[6]

DETERMINING ANIMAL RESISTANCE AND SUSCEPTIBILITY BY MEANS OF THE WHOLE-BLOOD TEST

It has been shown by the researches just cited that the whole, coagulable blood of animals naturally resistant to infection by a given organism possesses bactericidal or bacteriostatic power against that organism, and that such power is lacking in the blood of animals naturally susceptible to infection by that organism. If,

* Read before the Section on Practice of Medicine at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Heist, G. D.; Solis-Cohen, Solomon; and Solis-Cohen, Myer: The Bactericidal Action of Whole Blood, with a New Technique for Its Determination, J. Immunol. **3**: 261 (July) 1918. Solis-Cohen, Solomon; Heist, G. D., and Solis-Cohen, Myer: Observations on the Behavior of Diphtheria Bacilli in Whole, Coagulable Blood, with a Comparison of the Results of the Tests for Bactericidal and Antitoxic Immunity in the Same Persons, Tr. A. Am. Phys. **35**: 263, 1920. Heist, G. D.; Solis-Cohen, Solomon; and Solis-Cohen, Myer: A Study of the Virulence of Meningococci for Man and of Human Susceptibility to Meningococcic Infection, J. Immunol. **7**: 1 (Jan.) 1922.

2. Matsunami, Taitsu; and Kolmer, J. A.: The Relation of the Meningococcidal Activity of the Blood to Resistance to Virulent Meningococci, J. Immunol. **3**: 201 (May) 1918.

3. Bull, C. G., and Bartual, Louis: Pneumococcus Cultures in Whole Fresh Blood, I, The Retardative Effect of the Blood of Immune Animals, and the Mechanism of the Phenomenon, J. Exper. Med. **31**: 233 (March) 1920.

4. Black, J.; Fowler, Kenneth, and Pierce, Paul: Development of the Bactericidal Power of Whole Blood and Antibodies in Serum, J. A. M. A. **75**: 915 (Oct. 2) 1920.

5. Smiley, H.: Bactericidal Action of Blood of Rabbits Immunized Against Pneumococci, J. Infect. Dis., **33**: 88 (July) 1923.

6. Robertson, O. H., and Sia, R. H. P.: Studies on Pneumococcus Growth Inhibition, II, A Method for Demonstrating the Growth-Inhibitory and Bactericidal Action of Normal Serum-Leukocyte Mixtures, J. Exper. Med. **39**: 219 (Feb.) 1924.

for example, pneumococci [7] are seeded in vitro in the fresh, whole, coagulable blood of the susceptible mouse or rabbit, they multiply with great rapidity; while, when similarly seeded in the blood of the immune chicken, pigeon, cat or dog, they disappear.

In like manner, diphtheria bacilli [8] grow in the blood of the susceptible guinea-pig but disappear in the blood of the immune rat; meningococci [9] multiply in the blood of the susceptible mouse but are destroyed by the blood of the immune rabbit, and the globoid bodies of poliomyelitis [10] grow in human blood but are destroyed by rabbit's blood.

Heist and I,[10] working with many different microorganisms and different individuals, found great difference in individual responses, indicating either variations in the pathogenicity of various strains of the same micro-organism, or variations in the personal resistance to a given strain of different human beings.

Preliminary to a study of the differences of individual human beings in their resistance to a given pathogenic organism, Heist, Solomon Solis-Cohen and I [11] experimented with bacteria that are known to be practically harmless to men under ordinary conditions, and bacteria known to be commonly harmful to men.

As examples of the former, colon bacilli, isolated from feces, were seeded in the whole blood of fourteen normal men, and almost no growth occurred after twenty-four hours' incubation. As an example of the latter, a hemolytic streptococcus, isolated from a severe leg ulcer, following a shell wound, was planted in the blood of fifteen normal men and grew vigorously in the blood of all but two. These results indicated a certain correlation between the ability of bacteria to grow in the whole, coagulable blood of man and their virulence for man.

Studies were then made of the varying virulence of meningococci for man and the varying human susceptibility to meningococcic infection.[11] The bloods of eighty-five men were tested against meningococci freshly isolated from the spinal fluid of a patient with cerebrospinal meningitis, and the bloods of 172 men against different strains of meningococci from the throats of carriers. It was found that the whole coagulable blood of most men will permit the rapid growth of spinal fluid strains, indicating that most men are susceptible to attacks of meningococci that have passed through the human nervous system; while the blood of but few normal men permits the rapid growth of carrier strains, indicating resistance in this great majority and susceptibility to these in only one among many. This deduction was lamentably exemplified two years later when Dr. Heist, who was such a one, developed meningococcic meningitis and died, despite early diagnosis and thorough serum treatment.

EVIDENCE FROM BACTERINATION (VACCINATION)

The inference that growth of a given organism in the whole coagulable blood of an individual indicates susceptibility to that organism, while failure to grow indicates resistance, seems to be borne out by the results in my cases of inoculation with killed bacteria, the vaccines consisting chiefly of organisms against which the patient's blood showed little or no antibacterial power. Bactericidal power against given organisms may be developed in animals lacking it through progressive inoculations. Thus, such bactericidal power has been developed in the blood of mice against pneumococci (Solomon Solis Cohen and Heist [12]) and against meningococci (Matsunami [13]); and in rabbits against pneumococci (Smiley [5]); against typhoid bacilli and Shiga bacilli (Black, Fowler and Pierce [4]), and against the diphtheria bacillus(Solomon Solis-Cohen, Myer Solis-Cohen and Borow [14]).

BACTERIAL INFECTION OF THE UPPER RESPIRATORY TRACT IN THE ABSENCE OF DEMONSTRABLE TISSUE CHANGE

It is customary to associate infection with demonstrable evidence of disease. When a rhinolaryngologist reports that there is no pathologic condition in the upper respiratory tract, both he and the internist regard those parts as free from infection and eliminate them in the search for a focus. They fail to recognize that it is the presence of bacteria, pathogenic to the individual, that constitutes an infection, not the presence of grossly diseased tissue. Undoubtedly, such diseased tissue, and especially pus, presupposes the existence of a bacterial infection; but the reverse is not true.

BACTERIAL INFECTION OF THE APPARENTLY NORMAL RHINOPHARYNX

As I [15] have recently pointed out, a normal looking rhinopharynx frequently is the site of focal infection. It is, in fact, one of the most important sites in the upper respiratory tract. Ignorance of this possibility has doubtless led in many instances to the missing of the focus of infection and to the removal on suspicion of healthy teeth and tonsils. When a patient does not improve after the removal of diseased tonsils it may be because the rhinopharyngeal focus remains. Failure of autogenous vaccine therapy following tonsillectomy may sometimes be explained by the fact that vaccines prepared from the organisms found in the tonsils frequently do not contain the organisms, pathogenic for the patient, present on the rhinopharynx but not present in the tonsils.

BACTERIAL INFECTION OF THE APPARENTLY NORMAL NARES

The portion of the upper respiratory tract least likely, in the absence of disease, to be infected with microorganisms, pathogenic for the patient, is the nares. Yet, in some cases, although apparently healthy, the nasal passages act as a focus of infection. Especially after the removal of diseased tissues are they likely to retain the organisms that caused the pathologic condition, and which continue the infection after an apparently successful operation. It is probably such a continuing infection that keeps up the ethmoiditis that permits polyps to return after their complete removal, that is responsible sometimes for the persistance of asthma, and that occasionally prevents the cure of hay-fever. When vaccine prepared from organisms obtained from the tonsils fails to remedy an arthritis, one reason may be that it fails to contain organisms from the nose, specifically pathogenic for the patient, which were not present in the tonsils.

7. Heist, Solis-Cohen, and Solis-Cohen (Footnote 1). Bull and Bartual (Footnote 3). Smiley (Footnote 5). Robertson and Sia (Footnote 6).
8. Solis-Cohen, Heist and Solis-Cohen (Footnote 1, second reference).
9. Heist, Solis-Cohen and Solis-Cohen (Footnote 1, first reference).
10. Solis-Cohen, Myer, and Heist, G. D.: A Method of Distinguishing, from Among Various Organisms Present in a Patient, Those That Are and Those That Are Not Acted Upon by the Patient's Whole Blood, Penn. M. J. **25**: 27 (Oct.) 1921.
11. Heist, Solis-Cohen and Solis-Cohen (Footnote 1, third reference).
12. Heist, G. D., and Solis-Cohen, Solomon: The Bactericidal Action of the Whole Blood of Rabbits Following Inoculations of Pneumococcus Bacterins, J. Immunol. **4**: 147 (July) 1919.
13. Matsunami, Taitsu: Studies on the Meningococcidal Activity of Blood, J. Immunol. **5**: 51 (Jan.) 1920.
14. Solis-Cohen, Solomon; Solis-Cohen, Myer, and Borow, L. S.: Further Observations on the Behavior of Diphtheria Bacilli in Whole, Coagulable Blood, Tr. A. Am. Phy. **36**: 98, 1921.
15. Solis-Cohen, Myer: The Rhinopharynx as a Site of Focal Infection, Ann. Otol., Rhinol. & Laryngol., to be published.

BACTERIAL INFECTION OF THE APPARENTLY NORMAL TONSILS

Bacterial infection of a tonsil pronounced not diseased by a competent rhinolaryngologist is rare, but occasionally does occur.

BACTERIAL INFECTION OF THE TONSILLAR FOSSA, AFTER COMPLETE TONSILLECTOMY

Much more frequent is the presence of a bacterial infection of the tonsillar fossae, from which the tonsils have been removed at a more or less remote period. It is the overlooking of this condition by both rhinolaryngologist and internist that so frequently misleads them. With the extirpation of diseased tonsils, they believe the infection has been removed. Most heart specialists, for instance, insist on the excision of diseased tonsils; some even have all tonsils removed on suspicion. They then believe that all sources of infection have been removed from the throat, seeming not to realize that it is the micro-organisms, pathogenic for the patient and present in the throat, that are the agents of infection, not the diseased tonsillar tissue. Study of the bacteria in the throat, by the pathogen-selective method, would demonstrate in many of these cases that the same organisms that have flourished in the tonsils are still persisting on the mucous membrane, and that, subsequent to the tonsillectomy, the patient has acquired little or no resistance against them. This means that the bacterial focus of infection still remains in the throat, and that the physician has been deluding himself in thinking that it has been removed. Bacteriologically speaking, tonsillectomy merely removes the bacteria retained in the tonsil as it is excised. The organisms that are on other parts of the throat, and those that spill out on the throat during the operation, frequently persist and multiply, and they or their toxins may be carried to distant tissues and organs. The record of a tonsillectomy in a patient's history always makes me suspect the presence of a bacterial infection in the throat, rather than satisfies me that all infection there has been removed.

The frequent failure of tonsillectomy to relieve the condition for which it was performed may be based on failure to recognize the persistent throat focus.

TREATMENT OF BACTERIAL INFECTION OF AN APPARENTLY NORMAL UPPER RESPIRATORY TRACT

An infection due to the presence, on an apparently normal upper respiratory tract, of organisms pathogenic for the patient, because of the absence in the patient's blood of sufficient bactericidal or bacteriostatic power against them, can be treated only by developing and increasing in such patient this lacking power. This is accomplished by the proper administration of a properly prepared bacterial vaccine.

ESSENTIALS OF A PROPERLY PREPARED BACTERIAL VACCINE

Successfully to combat a bacterial infection, the killed culture must contain all the organisms in the infected area that are pathogenic for the patient. As I have shown in previous papers,[16] different organisms are frequently present on different portions of the upper respiratory tract. When cultures are taken separately from each tonsil or tonsillar fossa, each naris and the rhinopharynx, certain organisms will be found present in one culture that are absent from another. Organisms will usually be obtained from the rhinopharynx, for instance, that are not found on the fauces, and vice versa. Consequently, a culture obtained from the tonsillar crypts alone will seldom contain all the organisms that are present in the nares and the rhinopharynx. It is evident that a vaccine prepared from a partial culture cannot cause increase in bactericidal power against the organisms that it does not include. To be effective, therefore, a vaccine for the treatment of infection of the upper respiratory tract should contain all the organisms pathogenic for the patient that are present in any and all parts of that tract.

These organisms can often be obtained on ordinary culture. Sometimes, however, as pointed out earlier, an organism, nonpathogenic for the patient, is present in such large numbers that it will overgrow and inhibit the growth of an organism pathogenic for the patient, but which is present in relatively small numbers. A vaccine prepared from such a culture will consequently fail to contain the very organisms that are necessary to make it effective.

Furthermore, there is little reason for inoculating large numbers of organisms against which the patient's blood already has good bactericidal power. Yet such organisms frequently make up the usual autogenous vaccine, which consists chiefly of the predominating organism. It will readily be seen that, even should all the organisms pathogenic for the patient be present in such a vaccine, they may represent such a small fraction of the whole that they are ineffective. When the physician, for instance, administers 100,000,000 killed organisms of such a vaccine, he may be giving only 5,000,000 or 10,000,000 of the only organisms that could accomplish what is desired. By means of the pathogen-selective culture, however, it is possible to make up the vaccine intelligently. A good general rule is to use from 90 to 95 per cent. of the organisms that are pathogenic for the patient, and from 5 to 10 per cent. of the organisms that appear to be nonpathogenic to him. The latter are introduced in order to reproduce some of the environment, on the supposition that the symbiosis may have some effect on the virulence.

Another advantage of the pathogen-selective method is that the blood usually destroys any saprophytic organisms that may contaminate the culture.

THE PROPER ADMINISTRATION OF BACTERIAL VACCINE

The method of administering the vaccine is another important factor. It should be based on the individual reactions observed. The development of bactericidal substances progresses differently in different individuals and against different organisms; hence, the dosage never can be accurately determined in advance. An initial dose of 50,000,000 killed organisms is commonly safe, but each subsequent dose will depend on the degree of the local, general and focal reactions to the previous dose. Frequently, the increase must be extremely gradual. Sometimes, no increase at all can be given for several doses.

It is probable that routine administration with doses determined in advance by manufacturer or bacteriologist, instead of careful adjustment of dose and interval to the individual reaction, is responsible for many of the failures in vaccine therapy.

VISCERAL DISEASE DUE TO A PURELY BACTERIAL INFECTION OF UPPER RESPIRATORY TRACT

Many tissues and organs may become the seat of disease due to the action of micro-organisms or their

16. Solis-Cohen, Myer; and Heist, G. D. (Footnote 10). Solis-Cohen, Myer (Footnote 15); Lingering Influenza, Am. J. Clin. Med. 31:11 (Jan.) 1924.

toxins, carried from a bacterial focus in an upper respiratory tract that, to the trained eye, presents no macroscopic alteration in structure. Among the examples of visceral disease so produced, reported in this paper, are cases of myocarditis, endocarditis, nontuberculous pulmonary infiltration, pyelitis, cystitis, cholecystitis and appendicitis.

First are reported those cases with no history of the patient at any time having had gross disease in the upper respiratory tract. Thereafter are reported the cases of those patients from whose upper respiratory tract pathologic tissue has at some time been removed. In all the cases reported, the upper respiratory tract has been pronounced normal at the time of examination by a competent rhinolaryngologist. In some patients, the sinuses were examined by roentgen ray with negative results.

CASES IN WHICH THE UPPER RESPIRATORY TRACT HAS NEVER EXHIBITED GROSS EVIDENCE OF DISEASE

CASES OF MYOCARDITIS

CASE 1.—A man, aged 64, was suffering from myocarditis of twenty years' duration, toxemia and cardiac dilatation. All the teeth were lost from pyorrhea. The urine and the blood chemistry (i. e., blood urea, blood urea nitrogen and blood sugar) were normal. The Wassermann test and the roentgen-ray examination of the chest and nasal accessory sinuses were negative. The feces contained 70 per cent. gram-negative organisms to 30 per cent. gram-positive. The blood showed a slight degree of anemia.

The tonsils contained a nonhemolytic streptococcus and *Micrococcus catarrhalis*, pathogenic for the patient; pneumococcus, slightly pathogenic for him, and *Staphylococcus pyogenes-albus*, nonpathogenic for him.

The rhinopharynx contained *Staphylococcus pyogenes-albus*, pathogenic for him; pneumococcus, slightly pathogenic for him, and *Staphylococcus pyogenes-albus*, nonpathogenic for him.

CASE 2.—A woman, aged 48, had suffered from myocarditis and thyroid enlargement for eighteen years, and was suffering acutely from cardiac dilatation, pulmonary edema, hemoptysis, marked arrhythmia with auricular fibrillation, tachycardia and weakness.

The blood picture, blood chemistry and urine were normal. The Wassermann reaction was negative.

Physical examination of the lungs, after the pulmonary edema had cleared up, showed a general infiltration. Roentgen-ray examination disclosed an infiltrating process in both the upper lobes and moderate fibrosis, spreading from the hilum field to the bases.

The tonsils contained Friedländer's bacillus, highly pathogenic for the patient, and a nonhemolytic streptococcus and *Micrococcus catarrhalis*, nonpathogenic for her. A culture of the rhinopharynx gave identical results.

Ten and a half weeks later, cultures on Löffler's medium were made of the sputum and of the upper respiratory tract.

The sputum contained Friedländer's bacillus, which grew profusely, a few pneumococci, *Micrococcus catarrhalis* and a few streptococci, but no tubercle bacilli.

The rhinopharynx contained Friedländer's bacillus, which grew profusely, *Bacillus pseudodiphtheriae* and *Staphylococcus pyogenes-albus* in small numbers.

The tonsils contained Friedländer's bacillus, which grew profusely, a few pneumococci, a few nonhemolytic streptococci and *Micrococcus catarrhalis*.

The nares contained *Staphylococcus pyogenes-aureus* and *albus* and a few *Bacilli pseudodiphtheriae*.

Some improvement followed the ordinary treatment for cardiac decompensation, but marked benefit resulted from the administration of a vaccine made chiefly from the offending organisms.

CASE 3.—A man, aged 47, had myocarditis of three weeks' duration, with cardiac enlargement and some decompensation. The urine and the blood chemistry were normal. The Wassermann test was negative. The blood showed a slight degree of anemia and a slight leukocytosis.

The nares contained *Staphylococcus pyogenes-albus*, slightly pathogenic for the patient, and *Bacillus pseudodiphtheriae*, nonpathogenic for him.

The tonsils contained a nonhemolytic streptococcus that had very little pathogenicity for him, *Staphylococcus pyogenes-albus* and *aureus*, pathogenic for him, and *Bacillus pseudodiphtheriae* and pneumococcus, nonpathogenic for him.

The rhinopharynx contained *Staphylococcus pyogenes-aureus* and *Micrococcus catarrhalis*, pathogenic for him, and *Bacillus pseudodiphtheriae*, nonpathogenic for him.

CASE 4.—A man, aged 63½, had lingering influenza of four years' duration, myocarditis and slight cardiac enlargement. The urine and the blood chemistry were normal. The Wassermann test was negative. The blood showed slight polycythemia, and slight leukocytosis.

The tonsils contained a nonhemolytic streptococcus and *Micrococcus catarrhalis*, pathogenic for the patient, and *Staphylococcus pyogenes-albus* and *Bacillus pseudo-diphtheriae*, that failed to grow in his blood.

The rhinopharynx contained a nonhemolytic streptococcus, *Micrococcus catarrhalis* and *Bacillus pseudodiphtheriae*, pathogenic for him, and *Staphylococcus pyogenes-albus*, nonpathogenic for him.

CASE 5.—A woman, aged 39, had myocarditis following lingering influenza of two months' duration. The urine was normal.

The right tonsil contained *Streptococcus viridans*, pathogenic for the patient, pneumococcus, that grew up slightly in her blood, and *Micrococcus catarrhalis*, nonpathogenic for her.

The left tonsil contained *Staphylococcus pyogenes-aureus* and *Streptococcus viridans*, pathogenic for her, and pneumococcus and *Micrococcus catarrhalis*, nonpathogenic for her.

The nares contained *Staphylococcus pyogenes-aureus* and *albus*, very slightly pathogenic for her.

The rhinopharynx contained *Streptococcus viridans*, pathogenic for her, staphylococcus, having little pathogenicity for her, and pneumococcus, having none.

Marked improvement followed the administration of vaccine, made chiefly from those organisms showing pathogenicity for her.

CASES OF ENDOCARDITIS

CASE 6.—A boy, aged 15 years, had mitral regurgitation and aortic roughening, marked cardiac dilatation, and myocarditis, with marked decompensation.

The tonsils and rhinopharynx contained *Staphylococcus pyogenes-aureus* in large numbers, and *Streptococcus non-hemolyticus*, in small numbers, both pathogenic for him, *Micrococcus catarrhalis*, slightly pathogenic for him, and pneumococcus, nonpathogenic for him.

The nares contained *Staphylococcus pyogenes-albus*, pathogenic for him, and *Bacillus pseudodiphtheriae*, slightly pathogenic for him.

CASE 7.—A girl, aged 8 years, had chorea of four weeks' duration, cardiac dilatation and aortic roughening. She had three decayed teeth, which were extracted. There was a mild degree of anemia, and a moderate leukocytosis.

The nares contained *Staphylococcus pyogenes-aureus*, pathogenic for the patient.

The tonsils contained diphtheroids, pathogenic for her, and a nonhemolytic streptococcus, which failed to grow up in her blood.

The rhinopharynx contained a nonhemolytic streptococcus, pathogenic for her, and *Micrococcus catarrhalis*, nonpathogenic to her.

CASE 8.—A girl, aged 6 years, had mitral regurgitation and aortic obstruction, with enormous cardiac dilatation and marked decompensation. There was congestion of the kidneys, the liver and the spleen, and a marked anemia. A blood culture was negative.

Both the throat and the rhinopharynx contained a nonhemolytic streptococcus, pathogenic for her.

CASE OF CHOLECYSTITIS AND APPENDICITIS

CASE 9.—A woman, aged 34, had mild cholecystitis of fifteen years' duration, mild chronic appendicitis, and toxemia. The

diagnosis of the first two conditions was confirmed by a roentgen-ray gastro-intestinal study, and of the first by duodenal drainage as well. The urine, blood chemistry and feces were normal. Organisms in the feces were in the proportion of 75 to 80 per cent. gram-negative to 25 to 20 per cent. gram-positive. The Wassermann test was negative.

The right tonsil contained a nonhemolytic streptococcus and leptothrix, pathogenic for the patient, and *Micrococcus catarrhalis* and a gram-negative bacillus, nonpathogenic for her.

The left tonsil contained *Streptococcus viridans* and *Staphylococcus pyogenes-aureus*, pathogenic for her, and *Micrococcus catarrhalis*, nonpathogenic for her.

The rhinopharynx contained *Streptococcus viridans*, pathogenic for her; *Bacillus pseudodiphtheriae*, slightly pathogenic for her, and *Micrococcus catarrhalis* and *Staphylococcus pyogenes-albus*, nonpathogenic for her.

The duodenal fluid, after drainage, contained *Bacillus coli* and *Staphylococcus pyogenes-aureus*, pathogenic for her, and *Staphylococcus pyogenes-albus* and a gram-positive bacillus, nonpathogenic for her.

The feces contained Bacillus coli, a nonhemolytic streptococcus, *Staphylococcus pyogenes-albus* and a few unidentified organisms, pathogenic for her, and *Bacillus mesentericus*, *Staphylococcus pyogenes-aureus*, a gram-positive coccobacillus and possibly other unidentified organisms, which failed to grow in her blood.

CASE OF PYELITIS AND CYSTITIS

CASE 10.—A woman, aged 38, had suffered for a year and a half from cystitis and pyelitis of the right kidney, and toxemia. Treatment through the cystoscope failed to cure the condition. The urine contained a trace of albumin, pus cells, very many bladder and a few renal cells, some cylindroids and extremely few hyaline casts. The blood chemistry was normal. The Wassermann test was negative. The gram-negative organisms in the feces were 75 per cent., to 25 per cent. of gram-positive organisms.

The nares contained *Staphylococcus pyogenes-albus*, slightly pathogenic for the patient, and *Micrococcus catarrhalis*, nonpathogenic for her. The right tonsil contained *Streptococcus viridans* and *pneumococcus*, slightly pathogenic for her, and *Staphylococcus pyogenes-albus*, nonpathogenic for her.

The left tonsil contained *Streptococcus viridans* and leptothrix, pathogenic for her, and *Micrococcus catarrhalis*, nonpathogenic for her.

The rhinopharynx contained a nonhemolytic streptococcus, pathogenic for her, *Micrococcus catarrhalis*, which grew slightly in her blood, and pneumococcus, nonpathogenic for her.

The feces contained *Bacillus coli*, *Bacillus mesentericus*, staphylococci and other unidentified organisms, which grew in her blood.

The urine contained *Staphylococcus pyogenes-albus*, pathogenic for her, and *Bacillus pseudodiphtheriae*, slightly pathogenic for her.

The patient improved greatly under treatment with vaccine prepared according to the method I have described, and, in addition to the general and local reactions, always exhibited focal reactions in the bladder and in the upper respiratory tract after each dose. The patient finally would come for vaccine treatment only at intervals of a month or so, and the symptoms returned.

An ordinary culture of the urine, seven months after the first culture, showed a profuse growth of *Bacillus coli* and a sparse growth of *Staphylococcus pyogenes-albus*.

Pathogenic-selective and ordinary cultures were taken nine days later with the following results:

The rhinopharynx contained a nonhemolytic streptococcus and pneumococcus, pathogenic for the patient, and *Micrococcus catarrhalis*, *Bacillus pseudodiphtheriae* and *Staphylococcus pyogenes-albus*, nonpathogenic for her.

The tonsils cotained a nonhemolytic streptococcus, pathogenic for her, *Micrococcus catarrhalis*, which grew slightly in her blood, and *Staphylococcus pyogenes-albus*, nonpathogenic for her.

The urine contained only *Bacillus coli*, which grew very sparsely in her blood.

A new vaccine was prepared, small doses of which caused marked focal, general and local reactions.

CASES IN WHICH DISEASED TISSUE HAS BEEN REMOVED FROM THE UPPER RESPIRATORY TRACT

In a patient seen for the first time after operation, it is sometimes impossible to say whether or not the visceral disease existed before the removal of the infected tissue.

CASES OF ENDOCARDITIS

CASE 11.—A girl, aged 8, whose tonsils had been removed the preceding year, presented aortic obstruction, cardiac dilatation and myocarditis, with decompensation. The electrocardiogram was normal. The urine showed a trace of albumin and some leukocytes. The blood showed a moderate degree of anemia. The Wassermann test was negative. A blood culture was sterile.

The tonsillar fossae and rhinopharynx contained *Streptococcus hemolyticus*, pathogenic for the patient, and staphylococci, nonpathogenic for her.

A marked improvement followed the use of a vaccine made from this *Streptococcus hemolyticus*.

CASE 12.—A girl, aged 11 years, who had had the tonsils removed during her sixth year, had exhibited some cardiac symptoms for two years, and had a slight mitral regurgitation. The Wassermann test was negative.

The rhinopharynx and the tonsillar fossae contained *Micrococcus catarrhalis* and a gram-negative bacillus, pathogenic for the patient, *Staphylococcus pyogenes-aureus* and *albus*, slightly pathogenic for her, and *Bacillus pseudodiphtheriae* and pneumococcus, nonpathogenic for her.

The nares contained *Staphylococcus pyogenes-albus* and *aureus* and *Micrococcus catarrhalis*, pathogenic for her.

CASE 13.—A man, aged 21, whose tonsils had been removed eight months previously, had been suffering from symptoms of toxemia for three years, but did not complain of any particular symptoms referable to the heart, although examination showed mitral regurgitation. The urine and the blood chemistry were normal. The Wassermann test was negative. The gram-negative organisms in the feces were 90 per cent., to 10 per cent. gram-positive. The blood showed a mild degree of anemia.

The tonsillar fossae contained *Streptococcus viridans* and *Micrococcus catarrhalis*, pathogenic for the patient, and *Staphylococcus pyogenes-albus* and pneumococcus, which failed to grow up in his blood.

The rhinopharynx contained *Streptococcus viridans*, *Micrococcus catarrhalis* and *Staphylococcus pyogenes-albus*, which grew up in his blood; pneumococcus, which grew up slightly, and *Bacillus pseudodiphtheriae*, nonpathogenic for him.

CASE OF APPENDICITIS

CASE 14.—A man, aged 34, who had had a thyroidectomy performed thirteen years previously for exophthalmic goiter of one year's duration, had suffered for a year with occasional muscle pains. The urine was normal. A fractured nasal septum dammed up the normal nasal secretion, and the tonsils were infected. The former was straightened and the latter were removed.

As the muscular pains persisted two months after the tonsillectomy and became even more severe and more frequent, a culture was taken of the upper respiratory tract.

The tonsillar fossae contained Friedländer's bacillus, pneumococcus and *Micrococcus catarrhalis*, pathogenic for the patient.

The nares contained *Staphylococcus pyogenes-albus*, pathogenic for him.

The culture from the rhinopharynx was contaminated with *Bacillus subtilis*, which grew heavily in the ordinary culture and but sparsely in the culture in the patient's blood.

Because of the contamination, the patient was requested to come for another culture, but failed to do so, as his pains were less. He later developed appendicitis, and eight months after tonsillectomy, the appendix was removed.

An ordinary culture of the excised appendix showed the presence of a nonhemolytic streptococcus, *Bacillus coli* and *Bacillus mesentericus*.

Pathogen-selective and ordinary cultures of each tonsil and of the rhinopharynx were made two weeks and a half later.

The left tonsil contained *Streptococcus viridans*, pathogenic for the patient, *Micrococcus catarrhalis*, slightly pathogenic for him, and *Bacillus fusiformis*, nonpathogenic for him.

The right tonsil contained *Streptococcus viridans*, pathogenic for him; *Staphylococcus pyogenes-albus*, slightly pathogenic for him, and *Bacillus fusiformis* and *Micrococcus catarrhalis*, which were killed by his blood.

The rhinopharynx contained a nonhemolytic streptococcus, pathogenic for him; *Micrococcus catarrhalis*, slightly pathogenic for him, and *Staphylococcus pyogenes-aureus* and *albus*, which were killed by his blood.

Marked improvement in the muscle pains followed treatment with a vaccine prepared from these organisms.

CONCLUSIONS

1. The upper respiratory tract may be the site of focal infection without exhibiting visible alteration in structure.

2. By means of the pathogen-selective method of culture, in which culture is made in the patient's whole, coagulable blood, it is possible to determine whether or not micro-organisms present in a patient are pathogenic for him, and thus to differentiate infection from infestion.

3. Visceral disease may be produced by micro-organisms, pathogenic for the patient, present on an upper respiratory tract in which no tissue change is demonstrable.

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A PHYSIOLOGIC CONSIDERATION OF THE GALLBLADDER *

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The gallbladder excited the natural curiosity of the older physiologic philosophers, and at all times has been enough of an enigma to command the interest of certain physiologists. In general, however, the physiologists have maintained an indifferent attitude toward the possible functional significance of the gallbladder, and many textbooks on physiology do not mention it. The fact that the organ is the usual site of gallstones, and is so often involved in pathologic processes has, of necessity, kept the pathologist cognizant of it. However, the gallbladder really first became known when the surgeon found that he could drain or remove it, and its position in medical literature was assured when the internist reported that he also could drain it.

As has happened in many other instances, the renewed interest in the gallbladder from the surgical and medical standpoint has stimulated its study physiologically and pathologically. Accordingly, whatever may be the beneficial results of the surgical controversy with regard to drainage or removal, and the surgical and medical controversy with regard to whether the knife or the duodenal tube shall prevail, it must be admitted that these contentions have awakened renewed interest in the physiology of the gallbladder; and, if the slowly accumulated, fundamental facts with regard to its physiology and pathology are not obscured too quickly by fancy and imagination, our knowledge of this interesting structure will be increased.

My purpose in this article is to present the definitely proved facts concerning the possible functions of the gallbladder; to emphasize the fact that it does have a functional significance; to show that different phases of its functional activities can be experimentally demonstrated; to present evidence that pathologic processes can very readily interfere with its functions, and, finally, to correlate many of the known facts by an hypothesis of its functions.

In an article reviewing the older observations on the gallbladder, Sweet [1] has aptly compared the present status of the gallbladder with that of the tonsil and the appendix, illustrating the fact that little consideration is given to the possibility of the gallbladder having a physiologic rôle. While there can be no question that surgery of the biliary tract is one of the valuable contributions to modern medicine, numerous patients having been restored to well being by cholecystectomy, and that man and all animals, so far as we can determine, can compensate perfectly for the loss of the gallbladder, it must not be forgotten that its function is significant.

METHODS OF DEMONSTRATING EXPERIMENTALLY THAT THE GALLBLADDER FUNCTIONS

One of the best means of determining whether an organ functions, and what the function may be, is to study the effect of its removal. It is fairly conclusive proof that an organ functions if a definite series of changes occur following its removal or loss. Many investigators have employed the ablation method in attempting to determine the function of the gallbladder.

Effect of Cholecystectomy on the Extrahepatic Biliary Tract.—The first observation on the effect of cholecystectomy, and one on which most investigators of the problem agree, was that the entire extrahepatic biliary tract became dilated following removal of the gallbladder, or ligation of the cystic duct. Within a few weeks after the loss of the gallbladder, the ducts dilate from two to six times their preoperative diameter, as has been noted in a wide variety of species of animals, and in man. The exact mechanism producing the dilatation has not been fully demonstrated. It is known to depend on an intact sphincter of the choledeuct.[2] Dilatation does not occur if the sphincter is not active or is destroyed. Often the sphincter becomes more or less functionless by removal of the gallbladder, probably because its function is to keep the bile from passing into the duodenum and to force it into the gallbladder. When the latter is removed, the sphincter still attempts to do its part, and thus, at different periods in relation to variations in secretion of the liver, the pressure in the common bile duct is increased and dilatation results.

Effect of Cholecystectomy on the Development of Jaundice Following Obstruction of the Common Bile Duct.—The most conclusive and striking evidence of a definite function of the gallbladder was obtained by a series of experiments conducted by Bollman and myself,[3] in which a comparison was made of the development of jaundice following obstruction of the common bile duct in animals with the gallbladder intact, and in those in which the gallbladder had been removed. Animals in which the common bile duct is obstructed and the gallbladder left intact do not develop bilirubin in the plasma before twenty-four hours, and usually a

* From the Division of Experimental Surgery and Pathology, the Mayo Foundation.
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1. Sweet, J. E.: Mütter Lecture, Tr. Coll. Phys., Philadelphia, 1923.
2. Judd, E. S., and Mann, F. C.: The Effect of Removal of the Gallbladder, Surg., Gynec. & Obst. **24**: 437-442 (April) 1917.
3. Mann, F. C., and Bollman, J. L.: Unpublished data.

definitely positive test is not obtained before thirty-six hours. When the gallbladder is removed at the same time that the duct is ligated, the length of time between obstruction and the appearance of bilirubin in the plasma is greatly decreased. Often, a faintly positive test for bilirubin in the plasma can be obtained within three hours after obstruction of the duct, and the test is always positive at the end of from six to eight hours. It is thus possible, three hours after operation, to distinguish between the animals with obstruction that have had cholecystectomies and those whose gallbladders are intact. Thus, in a striking manner, the gallbladder is shown to have a definite functional significance. My observations tend to show that this difference in the rate of development of jaundice is dependent on the concentrating action of the gallbladder during the early period of the obstruction, so clearly demonstrated by Rous and McMaster.[4] It is possible that, when the gallbladder has concentrated all the bile secreted, it can no longer function, and at this point bilirubin appears in the blood. Assuming that this explanation is correct, it may be noted that the gallbladder is able to remove the water and store all the pigment produced by the body for at least twenty-four hours.

The Effect of Cholecystitis on the Action of the Gallbladder.—Whatever may be the function of the gallbladder, there are undoubtedly certain phases of its activities that are readily interfered with. Pathologists are aware of the fact that the gallbladder must be handled with the greatest care at operation or necropsy in order to preserve its normal structure. I have repeatedly observed dilatation of the common bile duct, similar to that which follows cholecystectomy, in animals in which the gallbladder became infected following the closure of a fistula of the gallbladder. The most conclusive evidence of the ease with which injury can affect the activity of the gallbladder is shown by certain experiments performed by Bollman, De Page and myself.[5] We noted that the intravenous injection of a solution of sodium hypoclorite produced specific cholecystitis. When the common bile duct was obstructed in dogs into which chlorin solution had been injected a few days previously, the rate of appearance of bile pigment in the blood was directly proportional to the degree of inflammation produced in the gallbladder by the chemical. In animals in which the gallbladder was greatly inflamed, the bilirubin appeared in the plasma at approximately the same time as it would if the gallbladder had been removed. When the gallbladder was only slightly inflamed, the appearance of bilirubin in the plasma was delayed almost as much as if the gallbladder had been intact. This may be regarded as an additional argument for the removal of the gallbladder when it is actually diseased. At any event, it illustrates the ease with which the activities of the gallbladder can be impaired.

IMPORTANT DATA CONCERNING THE PHYSIOLOGY OF THE GALLBLADDER[6]

Comparative Anatomy.—The many interesting studies on the comparative anatomy of the biliary tract have been of negative value, from the physiologic standpoint, more than of positive value. They have been of negative value, because they indicated that many of the theories concerning the general function of the gallbladder were untenable, as they were based on anatomic considerations only applicable to a small group of species. The observations on the comparative anatomy of the biliary tract have also made it impossible, at present, to explain the absence of the gallbladder in many species in accord with any known theory of gallbladder function. Comparative anatomy has clearly demonstrated one fact of physiologic importance: in all species of animals possessing a gallbladder, the anatomic arrangement is such that only part of the bile secreted by the liver ever enters the gallbladder. This is true whether or not there is more than one duct draining the liver into the duodenum; whether or not hepatic ducts enter the gallbladder directly; whether or not the gallbladder is far removed from the liver and duodenum, or whether or not it is embedded in the substance of the liver. There are no data extant with regard to the proportion of bile secreted which enters the gallbladder. It is possible that such data would show that most of the bile secreted by the liver reaches the gallbladder in some species; but from the standpoint of comparative anatomy, the gallbladder can be considered only a sampling mechanism in relation to the total amount of bile formed. This point must be considered in connection with the function of the gallbladder in which it is considered that the function is to produce a specific change in the character of the bile or in the metabolism of some constituent of it.

Anatomy of the Gallbladder.—The most important features of the anatomy of the gallbladder which seem to have a bearing on its activity are (1) an excellent lymphatic system, (2) a mucosa arranged to bring the contents into intimate contact with as much of its surface as possible, and (3) a weak, diffuse muscular coat. Anatomically, the gallbladder seems to be best fitted for absorption, and the purpose of the muscular coat to keep the contents well mixed and in contact with the mucosa.

Pressure Changes in the Biliary Tract.—It is important to know the course of the bile in the biliary tract, how and when the gallbladder fills, how and when it empties, and the pressure changes involved. In collaboration with Potter,[7] I have studied the pressure changes in the gallbladder and common bile duct of dogs under different conditions, such as fasting, following the ingestion of various kinds of foods, and vomiting. At first we thought that the pressure in the component parts of the biliary tract was approximately the same. Accordingly, we studied the pressure in the gallbladder only. Under ether anesthesia, and employing sterile technic, a small, permanent rubber or metal cannula was placed in the gallbladder, the remaining portion of the biliary tract being left intact. In certain animals, the cannula was kept closed except while observations were being made, and in others it was left open continuously. While the wound around the cannula was healing, the animal was made comfortable and trained. When it had learned to lie quietly for hours, usually sleeping, a straight glass tube was connected with the cannula by means of a T tube. Observations were made of the rate of rise of bile in the tube, the maximal pressure produced, variations in pressure, and the rate of decline in pressure. The variation in the pressure in the gallbladder depended on several factors. It was always low when the animal was in the fasting state, seldom as much as 100 mm. It always increased

4. Rous, Peyton; and McMaster, P. D.: The Concentrating Activity of the Gallbladder, J. Exper. Med. 34: 47-73 (July) 1921.
5. Bollman, J. L.; De Page, P., and Mann, F. C.: Unpublished data.
6. Owing to the brevity of this paper, a complete bibliography is not given, but reference is made to a recent review of the functions of the gallbladder in Physiological Reviews, April, 1924.
7. Mann, F. C., and Potter, J. C.: Unpublished data.

after the ingestion of food, although the rate and amount of increase depended on the type of food. Milk usually produced the quickest, as well as the greatest, increase in pressure. Sometimes there were small rhythmic changes in intragallbladder pressure, involving a change of from 20 to 40 mm. of bile, occurring from three to five a minute. We believed that these rhythmic changes were due to contraction of the gallbladder, although we were not able to prove it definitely. Observations were made on some of the animals two or three times a week for many months, and the results were fairly uniform. During this period, we thought that the pressure in the gallbladder and common bile duct was approximately the same. In order to prove this definitely, another series of experiments was performed, in which, besides placing a tube in the gallbladder, a small rubber T tube was placed in the common bile duct. In these experiments, therefore, the normal channel for the bile was not greatly interfered with, and we were able to observe the changes in pressure in the common bile duct and gallbladder at the same time. We were surprised to find considerable difference in pressure in the gallbladder and common bile duct, amounting often to 100 cm. The two pressures were usually the same for a short period, and then, rather suddenly, the pressure in the gallbladder increased greatly above that in the common bile duct, remaining so for many minutes. Often, there were rhythmic variations in pressure with opposite phases in the two component parts of the biliary tract, which suggested opening of the sphincter of the choleduct and contraction of the gallbladder, but we were unable to prove this. In certain experiments opaque mediums were injected into the gallbladder, and these changes studied by means of the roentgen ray. The results of these observations also suggested an interaction of the sphincter and gallbladder, but they were not conclusive.

The results of our numerous observations on the pressure changes in the gallbladder and common bile ducts have proved that the pressure in the gallbladder varies, depending on the digestion of different kinds of foods, and other factors, being greater during the first periods of digestion, and also that the pressure in the gallbladder and common bile duct may be quite different. Except for the discovery that the gallbladder seems to fill more rapidly during digestion, we have not been able to determine how the gallbladder fills or how it empties. Practically nothing is known concerning these two most important phases of the gallbladder's activity. It should be emphasized that, in our experiments, as well as in all operations on the biliary tract, caution is necessary in drawing conclusions because of the probability that operative trauma or pressure of a foreign body will greatly disturb the normal action of the gallbladder.

Rate of Secretion of Bile by the Liver, and Its Rate of Discharge into the Duodenum.—The results of the observations of various investigators on the secretion of bile in animals with a bile fistula have shown that, while the rate is very irregular, the secretion is more or less continuous, and the rate increases during digestion. The rate of the discharge of bile into the duodenum indicates that during the interdigestive periods but little bile passes into the duodenum. The rate of the production of bile by the liver was estimated by suturing a small ureteral catheter in a hepatic duct under sterile anesthesia with sterile technic. As the lobes of the dog's liver are distinct, and usually drain through one duct, we were able to observe the rate of secretion of a part of the liver without affecting the rest of the biliary tract or interfering with anything it might do bearing on the activity of the liver. We found that the rate of bile secretion by a lobe of liver, with the rest of the biliary tract left intact, varied, and the variations were usually rhythmic. Sometimes the liver, in the fasting state, secreted practically no bile; it was always much more active during digestion.

The Gallbladder as an Excretory Organ.—In an endeavor to determine the manner in which the gallbladder filled and emptied, if at all, we employed some of the dyes that are excreted by the liver. Rose bengal, a deep red dye, gave promise of being the most valuable. It is readily excreted by the liver, is not quickly destroyed, and its color is easily followed by the naked eye. We have noted the appearance of the dye in the gallbladder immediately after intravenous injection, and again within five minutes after injection. Within an hour, the gallbladder was usually distended with the dye, and a quantitative estimation showed that approximately 50 per cent. of the total amount of dye injected had entered the gallbladder by this time. The dye was present in the gallbladder as long as six days after injection in one dog, and had disappeared by the tenth day in another. There was approximately the same amount of dye in the gallbladder in the fasting and in the digesting state at the same time after injection. As this finding was so different from those in the experiments in which we studied the pressure changes in the biliary tract, we suspected the presence of some other factor. Accordingly, we ligated the cystic duct in several dogs, and then injected the dye. While most of the dye was excreted by the liver, it also appeared in the gallbladder with the cystic duct closed. This, of course, made our previous observations with the dye questionable as regards the filling and emptying of the gallbladder. However, we know definitely that the gallbladder can excrete one substance, rose bengal.

The Concentrating Activity of the Gallbladder.—One of the most important phases of the gallbladder's activity, which was proved quantitatively by Rous and McMaster, is the power to concentrate the contents by the withdrawal of fluid. In this regard, the gallbladder may be considered a reservoir for storage, a place where an important change is produced in some constituent of the bile, or where a new product is added to it. If the gallbladder acts as a storage reservoir, it is highly probable that the concentrated bile is of some value.

The Cholagogue Action of Bile Salts.—The liver pharmacologically is rather a unique organ in that so few substances stimulate its secretory activity. The only substances that usually increase the flow of bile are bile salts. In our experiments these have almost invariably caused a marked increase in the secretion of bile, whether they were administered intravenously or through the duodenum. It should be noted that the bile salts are a normal constituent of bile, that the gallbladder bile contains a high percentage, and that they will stimulate the liver when given in amounts equal to that stored in the gallbladder.

HYPOTHESIS CONCERNING A FUNCTION OF THE GALLBLADDER

On the basis of the data obtained from our own experiments and from the results of the many carefully conducted researches of other investigators, an hypothesis of a function of the gallbladder has been formulated. My purpose in presenting this hypothesis is not, primarily, to assign to the gallbladder a special and specific

function, but to emphasize its functional importance, to correlate the known facts concerning its functional activities, and to point out the important fields in which data are still lacking. As an hypothesis it may not be correct; as a systematic statement of known facts, it should aid in eliminating the defects in our knowledge concerning the gallbladder. Most of the phases of this hypothesis are not new, but, rather, are emphasized in a new way and supported by additional data.

We have come to consider the gallbladder as a part of a mechanism whereby the secretory activity of the liver is correlated with that of the gastro-intestinal tract. It will probably be clearer if we describe how we think the gallbladder functions, and then emphasize the processes that have not as yet been proved.

In the fasting state preceding a meal, the liver is active, but the amount of bile secreted is relatively small. The gallbladder is partially filled with concentrated bile, a most important constituent of which are the bile salts. The sphincter at the end of the choleduct allows amounts of bile to escape into the duodenum only at infrequent intervals, and most of the bile secreted by the liver passes into the gallbladder. As soon as the ingested food passes the pylorus, the acid chyme causes the sphincter to relax, and coordinately with this, the gallbladder expels a small amount of its contents. The bile salts are quickly absorbed from the intestine, and stimulate the liver to increased activity. With the increased secretion of the bile, there is an increase in the flow to and from the gallbladder. With the stomach empty, and chyme no longer passing over the papilla, the sphincter opens more infrequently, and gradually the secretory activity of the liver is reduced to that of the fasting state. Practically all the bile secreted by the liver in the fasting condition is stored in the gallbladder by concentration. It therefore appears that the function of the gallbladder is to stimulate the liver to increased activity at the time the gastro-intestinal tract is most active.

In discussing this hypothesis of a function of the gallbladder, I wish to emphasize the following points as having some bearing on the question. Anatomically the gallbladder must be considered a sampling apparatus, in view of the fact that only a portion of the total amount of bile secreted ever enters it. The gallbladder is filled mostly during active digestion. This fact can also be considered as important in relation to the flow of bile and regulatory theories. The sphincter of the choleduct can as readily be considered a necessary mechanism for filling the gallbladder as for preventing the escape of bile into the intestine. The concentrating activity of the gallbladder would imply that some element of the bile is of value, and bile salts, as in the concentration in the gallbladder, are an efficient cholagogue. Evidence points to the fact that the secretory activity of the liver is correlated with the activity of the gastro-intestinal tract.

The most important objection to such an hypothesis is the question concerning the emptying of the gallbladder. Thus far it has not been proved that the gallbladder empties, or, in fact, that it can empty. A very suggestive method of studying this problem would be by an opaque medium excreted by the liver, as demonstrated by Graham and Cole.* Furthermore, no reciprocal physiologic action between the sphincter of the choleduct and the gallbladder has ever been demonstrated, although many observers have suggested this as a possibility. Our lack of knowledge with regard to these two important phases of the physiologic action of the gallbladder makes the hypothesis definitely unproved.

We performed one series of experiments which gives some support to the possibility that the gallbladder bears some relation to hepatic activity. A small rubber T tube was placed in a gallbladder, and a ureteral catheter in a hepatic duct. After the tubes had healed in position, and the bile from one lobe of the liver was draining to the surface, the following experiments were performed: After an eighteen-hour fast, collections of bile draining from the catheter were made every fifteen minutes for an hour or more, in order to obtain the rate of flow in the fasting animal, then about 20 c.c. of bile from the gallbladder of another animal was slowly injected into the gallbladder of the animal under observation. In a very few moments, the flow of bile from the lobe of liver draining to the surface was greatly increased, and the total amount secreted after injection was usually two or three times the amount secreted during the control period. This experiment has been repeated several times on different animals, and the results have been uniformly the same.

8. Graham, E. A., and Cole, W. H.: Roentgenologic Examination of the Gallbladder, J. A. M. A. 82:613-614 (Feb. 23) 1924.

ABSTRACT OF DISCUSSION

Dr. Moses Behrend, Philadelphia: I have performed most of the experiments mentioned, but in some I have not formulated conclusions. From the clinical standpoint, I do not feel that the gallbladder is of any particular value to the human economy. We all know of many gallbladders, disclosed at operation, which were of no use to the patient. There are many young persons whose gallbladders are not functioning, and many older persons with shriveled-up gallbladders that have not been functioning for a long time. Of what use has this organ been in their existence?

Dr. Charles Greene, Columbia, Mo.: To what extent does this operative procedure interfere with the nervous mechanism and the reflexes from the gallbladder, and on what particular part do they show with some weight and significance?

Dr. Frank C. Mann, Rochester, Minn.: Certain it is that the gallbladder has functions about which we know nothing, or virtually nothing. It is very easily damaged, and we may not even know that it has been damaged, but the effects will become apparent sooner or later.

Method of Demonstrating Spirochaeta Pallida in Tissues.—A simple and remarkably expeditious method of demonstrating *Spirochaeta pallida* in tissues has been devised by Dr. Walther Kranz of the skin department of the University of Cologne. The method is a modification of the procedure of Levaditi, over which, however, it has important advantages. These depend on the fact that impregnation with the silver nitrate is carried out in the sections and not in the uncut tissue. . . . The method is applicable to either frozen or paraffin sections; the material, of course, must be formaldehyd fixed. With frozen sections Dr. Kranz first washes in distilled water, then carries a number of the sections up to fifteen into a 0.1 per cent. solution of silver nitrate in distilled water, contained in test tubes; in this they are left in the paraffin oven for from four to twenty-four hours. They are then washed in distilled water and carried over into a solution consisting of pyrogallol, 0.2 gm.; distilled water, 15 c.c., and mucilage of acacia, 5 c.c. The reduction of the silver nitrate takes from thirty to sixty minutes, and should be controlled under the microscope; when it is complete, the sections are washed in running water to free them from the gum, carried through alcohol, and xylene, and mounted in the usual way. In dealing with paraffin material, the sections are first fixed to the slide and freed from paraffin, and then taken through the solutions as described above. No counterstain is necessary, and the picture is that of a Levaditi preparation. The whole procedure can readily be carried through within the period of an ordinary day.—*Lancet* 1:1119 (May 31), 1924.

THE MANAGEMENT OF IMPETIGO CONTAGIOSA IN MATERNITY HOSPITALS *

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"Impetigo contagiosa is breaking out on Baby C. in the nursery." To the hospital superintendent who has been through a previous epidemic of impetigo contagiosa, such an announcement brings immediate anxiety and fear, for she is confronted at that moment by the instant necessity for a change of routine in the nursery, a doubling or more in that part of the nursing personnel, and a ceaseless vigilance in the coming days, if this contagious disease is to be spared the other babies and even death warded off. And yet, in spite of the frequent occurrence of this important problem, the minutiae of treatment, so essential for the intelligent handling of these situations, are almost entirely lacking in the literature and the textbooks alike.

Knowles and Munson [1] review the literature on epidemics in institutions, and add to the series the details of three small outbreaks of impetigo in two hospitals under their own observation. Out of their ten patients, two died; but in both instances the deaths were complicated by infected harelip operations. The earlier literature reports mortalities of from 25 to 50 per cent. in a series of about thirty cases. In my own experience, there have been six deaths in a total of 144 cases occurring in sixteen epidemics in eight different hospitals. Of these 144 cases, there were forty-three of the ordinary mixed impetiginous and pustular type in a summer hospital camp for infants and young children. None of these children died.

The etiology of the bullous type of impetigo appears to be well established. While the ordinary crusted type is due to a streptococcus infection, investigation has shown repeatedly that *Staphylococcus pyogenes-aureus* is found in the unbroken blebs of the infantile type. In this respect, the paper of Knowles and Munson [1] confirms the earlier work of Schwartz [2] and Cole and Ruh.[3]

The primary lesion of the bullous type is a small, thin-walled bulla on a slightly inflammatory base. Following the early rupture of such a lesion, other lesions appear within a few hours. The crusting so conspicuous in the ordinary type is comparatively absent here. Within three or four days of the onset, a large proportion of the body may be involved, and the appearance in such cases is similar to a correspondingly severe burn. The constitutional symptoms also resemble those of burns. High temperature, bodily prostration and toxemia follow. Death occurs usually in those cases in which more than one third of the body is involved.

Differentially, the diagnosis lies between impetigo and syphilis of the bullous type and pemphigus neonatorum. The latter term, pemphigus neonatorum, is synonymous with impetigo contagiosa of the bullous type and should be discarded. Nevertheless, it is regarded as a separate clinical entity by many not particularly interested in dermatology. In syphilis of the bullous type, other stigmas of the disease are usually present. These include the appearance of the bullous lesions on the palms and the soles, mucous patches in the mouth, the characteristic senile face, enlarged liver, spleen or lymph nodes, painful joints, and the history of family infection. Many men regard the appearance of skin trouble in a new-born baby as equivalent to syphilis, and, of the deaths in this series, two children are buried today with death certificates reading "congenital syphilis" that should have read impetigo contagiosa of the bullous type. Under some conditions, such a mistake might prove of considerable embarrassment to both the hospital and the attending physician.

In the great majority of cases, it is impossible to tell the exact source of the infection. The disease descends over night on the ward without warning. In one instance, a nurse, returning from her vacation and going to work in the nursery with a patch of impetigo on her chin, started the infection, apparently. In another case, two small children with the disease, brought to the hospital to greet their newly arrived brother, were the source of the trouble.

If the disease is recognized in the early stages, the treatment of the individual is comparatively simple and the recovery prompt. The books still cling to the traditional ointment of ammoniated mercury in various strengths as the most effective medication. I myself prefer in these infant cases an ointment consisting of boric acid, one-half dram (2 gm.); precipitated sulphur, one-half dram (2 gm.); petrolatum, 1 ounce (30 gm.). If the child is older than 18 months, 20 grains (1.3 gm.) of salicylic acid is substituted for the boric acid. Still more important than any one formula of medication is the gentle but thorough removal of the accumulations of exudate with soap from a tube, water and sterile gauze two or three times a day. Removal should not be considered as successful until a red and oozing surface is revealed.

Although the local treatment of this condition is comparatively simple, the management of the hospital end is one to tax the resources of ingenuity to the utmost. Fortunately, this disease is selective, attacking the babies with avidity but sparing adults that come in contact with it almost without exception. In this series, I can only recall four or five persons about equally divided between nurses and mothers, that developed impetigo following contact with the affected babies. On those it did appear, the trouble was slight in extent and of the usual crusted variety.

But where the babies are concerned, impetigo contagiosa of the bullous type is contagious in the highest degree. It should take its place among the important contagious diseases of children, and be recognized as one of the very few contagious diseases to which infants are liable.

The conditions found in the usual maternity nursery are ideal for the spread by contact of a disease like impetigo. Ranged along the walls of a comparatively small room are small cribs so close together that the clothes of a nurse attending to a baby touch the adjoining crib. The babies are usually bathed and changed at a central point, either in the nursery itself or in an adjoining small bath room. Here the nurse takes each squalling youngster in turn, either holding him in her lap, or placing him on a common table. Until either wet or soiled, each child comes in contact with a common gown or table covering. Close at hand are kept a few basins for the several babies, piles of diapers, bands and clothes, on a common table, and large receptacles holding the powder, safety pins, olive oil, cotton,

* Read before the section on Dermatology and Syphilology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. Knowles, F. C., and Munson, H. G.: Institutional Epidemics of Bullous Impetigo Contagiosa in Infants, Arch. Dermat. & Syph. 7: 376 (March) 1923.

2. Schwartz: Bull. Lying-In Hosp., New York, June, 1908.

3. Cole, H. N., and Ruh, H. O.: Pemphigoid of the New-Born (Pemphigus Neonatorum), J. A. M. A. 63: 1159 (Oct. 3) 1914.

eye washes, etc. There is often the nursery rectal thermometer, immersed for three quarters of its length in a tumbler of mercuric chlorid solution.

Yet, if an epidemic of impetigo is to be successfully combated, all these methods must be changed in a way that fills the heart of any hospital superintendent with depression at the thought of the tremendously increased labor and expense involved.

All the babies in the ward should be inspected from head to foot. Those showing any signs of the disease should be kept in the original ward. The remainder, those exposed to contagion but not yet showing any evidence of the disease, should be placed in another room. New arrivals after that date should be kept either with their mothers or in a third room. Under no conditions are they to be placed in any contact, no matter how remote, with either the infected children, the suspects or the old nurses. As members of the exposed group develop the disease, they should be transferred to the original infected nursery for treatment. As the length of time that it is necessary for a new-born child to stay in the maternity hospital is about three weeks, it will not be long before the exposed group will be eliminated, either by the appearance of the disease or by their going home without its having developed. Nothing is of greater importance than this method of segregation of the children. If new arrivals continue to be placed in the nursery in which the infection started or in the second nursery for the suspects, the length of time that the disease may continue to reappear is unlimited. One hospital in which the necessity for the strict observance of this rule was not appreciated had a practically continuous run of the disease for more than two years. Where separate rooms are at a premium, as they so frequently are in small hospitals, the necessity for giving over three rooms for nursery purposes works considerable hardship and expense. And then, if through faulty technic the third group of new arrivals breaks out, the added demand for new rooms will be greater than the possible supply, and it will be necessary to close the maternity department for the time being.

The nursing personnel usually has to be rearranged or materially increased to take care of the burden of the added work. The nursery should be "specialed" by nurses who do nothing but take care of the infected babies and their mothers. Under no conditions are these septic nurses to care for the well babies or any other patients in the hospital, or even go into the operating or delivery rooms. Conversely, extreme care must be taken that a clean nurse doesn't relieve her companions in the nursery for a few minutes while the pressure of work may be high and then return to her former work.

The technic of caring for babies is simple in principle but hard to carry out without constant thought of detail by the nurses and watchful supervision by the hospital heads. It is based on the fact that we are dealing with a contagious disease that is transmitted by contact with infected material. In other words, it is essentially making a surgical operation every time the baby is touched. With this end in mind, each child is, of course, in his own separate crib, and each crib is far enough from its neighbors so that the attending nurse may pass about it without her clothes touching the others. Each baby is to have its own separate tray with his own clothes and toilet articles, such as basins, soap, pins, powder, oil and thermometer. When it becomes necessary to attend a baby for any reason, the nurse should wash her hands thoroughly with liquid soap and hot water. It is not necessary to perform a surgical scrub-up, but the washing should be thoroughly cleansing. She should then put on a clean surgical gown and attend the baby, as may be needed. It is not absolutely necessary that the gown should be sterile or that a fresh gown be put on every time she goes to the child, but it should be changed whenever wet or badly soiled, and at least once a day. After the baby has been cared for, the gown is removed, and the nurse should wash her hands after the operation as carefully as before. When she goes to a second child she should repeat the performance, taking care that she uses the gown belonging to the second child's unit. It is as important to go through this technic when the child is changed or carried to the mother for nursing as it is when the impetiginous lesions themselves are dressed.

Although the mother herself may not have the disease, she should be regarded as a source of infection. This is because, in the process of nursing the child, its infected clothes come in intimate contact with the mother and her bedclothes, and through them with the general materials used in her care. Thus, if a different nurse other than a septic nurse should care for the mother, she in turn could transmit the infection to a clean baby, a clean mother, or any one else with whom she comes in contact. In view of the number of times a day that it is necessary to minister to either a single mother or child, it is practically necessary to put a special nurse on every two or three cases.

Under such conditions, it takes considerable tact to handle the family, the visiting friends, and even those members of the visiting staff to whom the seriousness of this trouble is not familiar. No members of the family should be admitted to the nursery under any conditions. If the baby is with the mother when they are present, they should not touch the baby, the mother or the mother's bed. The attending physician must observe the same strict rules of asepsis. If he is to handle the child, he must wash thoroughly both before and after the examination, and under no conditions should he go from one child to another in the nursery or hospital without so doing. It is much preferable and equally practical for the nurse to hold the baby on her lap and turn it at will for the physician's examination. Under these conditions, if the physician will keep his hands in his pockets and regard the babies, nurse and cribs with the same respect that he pays to a sterile operating table, the visit may be made without any loss of time and without danger to other patients.

The disposal of contaminated clothes in a proper way is an important detail. Boiling is sufficient to prevent the possibilities of contamination. But it is essential that this laundering of the sheets, pillow cases, night clothes, diapers, gowns and towels be done separately from the routine hospital clothes.

One careless break in the technic may undo the careful work of days and start the contagion all over again. A little thing like the single omission of boiling a wash basin after the baby has been dressed may be the source of the spread. The use of a cake of soap, instead of an individual serving of soap powder or paste, will account for the continued breaking out of the impetiginous lesions on the individual baby, in spite of otherwise proper treatment. In one case, I recall a common bowl of safety pins, into which each nurse in turn put her contaminated fingers, as the probable focus of infection. The common practice of standing up a thermometer for three quarters of its length in a glass of some

antiseptic solution is very unclean. The upper quarter, well contaminated by the fingers of the nurse which have been held against the anal opening, is rarely cleaned or effectively sterilized.

At the end of an epidemic, the nursery in which the infected babies have been cared for must undergo a most painstaking and vigorous cleaning. Every bit of furniture must be scrubbed down with hot water and soap. The cribs should be taken apart if possible. All the furniture, including the mattresses, may well be taken out doors and exposed to the sun for several hours. Basins and instruments should be sterilized, and the cheaper containers, such as bottles and their contents, should be thrown away. The returning of various materials, such as throat sticks or pins, to the general supply should be prevented. The walls and woodwork should be scrubbed down as well; the ceiling should be recalcimined. Although not an absolute essential, it is recommended that the entire nursery be repainted. In the skin ward at the Massachusetts General Hospital, there is a nursery room to which are admitted young children, including those with impetigo contagiosa of the usual type. If, as it has occasionally happened, the disease gets out of bounds and appears on the noninfected children, we have found that it saves time and expense in the end to close the nursery for a week and wash and repaint the entire room.

One further point that is far from easy to settle: What duty does the hospital with bullous impetigo contagiosa in its nursery owe to the community in the matter of admitting new maternity cases to the hospital while the disease is rampant? How many physicians would be willing to have their own wives confined in a small hospital where this disease was present, even if the strictest segregation was being observed? Very few, I think. What is the legal responsibility of a hospital when a baby contracts the disease, and perhaps dies, when the mother was admitted after the presence of the disease had been recognized by the authorities? To say the least, the hospital that continues to admit patients under such conditions is indefensible, unless it is carrying out the most effective means known to prevent the spread of this dangerous and contagious disease.

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ABSTRACT OF DISCUSSION

DR. EVERETT S. LAIN, Oklahoma City: I appreciate the very thorough and detailed description of the methods that should be practiced, as delineated by the author. They may appear unnecessary; but when we consider the danger of death and the extremely embarrassing position it puts the obstetrician in to have this infection develop on the babe after birth, with the possibilities of its transmission to others, we can fuller appreciate his advice. Our university hospital at Oklahoma City has had an outbreak or two of this trouble in which the obstetrician first tried to control it, then the pediatrician, and eventually the cases were turned to the dermatologist. In making the search for the infection, we naturally followed first the sterilization methods of utensils, baths and the laundry. We were inclined to accuse the laundry, but could not prove this. We made many changes but had the impetigo with us still. We followed up everything we could think of, and finally came to the granite pans in which the infants were given their oil baths. I noticed some small cracks in the pans, and asked about the method of sterilization. I was told that they formerly used heat, but were then scrubbing them with compound solution of cresol. We abolished the use of the granite pans and had no new cases for many months. We are now trying a new treatment with very gratifying results. It is applications of mercurochrome-220 soluble after a previous rupturing of the vesicles and removal of the crusts. Only two or three applications have been necessary in some cases. We have sometimes used only one application, which was followed by a bland sterile wash, and it did away with impetigo.

DR. JOHN E. LANE, New Haven, Conn.: Dr. Blaisdell has given an excellent account of the precautions necessary for the prevention of the spread of this disease. The ointments used by Dr. Blaisdell are stronger than I have used lately. I have found that the weaker ointments, such, for instance, as a 2 per cent. ointment of yellow mercuric oxid, serve as well as the stronger ones. For the early lesions, I much prefer a solution to an ointment. If the vesicles are broken as soon as they appear and painted with a solution of protargin mild or a 5 per cent. solution of silver nitrate, they often develop no further. This is easier to apply than an ointment, and is not spread around. It is practically the same treatment as that suggested by Dr. Morrow for the ordinary impetigo of children, except that the strength of the solution is a little less. I prefer to have the nurse wear gloves. They do not need to be boiled between the handling of the different babies, but they are cleaned and approximately sterilized by washing on the hands much better than the hands are sterilized. I have always tried, not always with success, to have the babies kept from the breast till they are well, because I feel that there is considerable danger of a breast abscess developing if the mother is allowed to nurse the child.

DR. H. E. MÉNAGE, New Orleans: In New Orleans, with semitropical temperatures and excessive moisture, babies suffer excessively from prickly heat, making them an easy prey to pus infections, so that impetigos, followed by furunculosis, are very common conditions. Thorough ventilation of the nurseries, the babies being lightly clad, kept dry and well powdered, goes a long way in keeping them free from the infection. When infection does occur, good results are obtained by the use of sulphurated potassa, from 15 to 60 grains (1 to 4 gm.), in a small tub of water. The lesions are brushed off in the bath, and the baby is allowed to remain in the water as long as possible; no soap is used. After the bath, the patient is mopped dry and kept well powdered with a mild salicylated talcum powder. In this manner we have been able to limit the spread of this disease, with small expense and a minimum amount of trouble.

DR. CHARLES C. DENNIE, Kansas City, Mo.: Tub baths should never be used for children with skin diseases since one is very likely to implant new areas of infection on the skin. The enamel slab and the hand spray should be used in every case of impetigo and furunculosis. In this way the infection is washed off and the slab is easily sterilized for the next patient.

DR. J. HARPER BLAISDELL, Boston: The greatest difficulty we have is in trying to get the hospital authorities to recognize what they are facing. When a dermatologist comes into the hospital and orders such a general change in routine and arrangements, they carry it out just about half-way. It has been our experience that we might just as well cut off all of the dog's tail at once as to cut it off half way.

First Lying-In Hospital.—The first evidence of any specific provision for lying-in women occurs in the proposal of the Westminster Charitable Society, which in 1716 launched a scheme for the lodging, maintenance, and treatment of poor lying-in women in the parish of St. Margaret. In 1734 St. George's opened its doors: but lying-in women were specifically excluded. But eighteen months after its foundation, a suggestion was considered by the governors of St. George's for setting aside one ward for lying-in women, to receive twenty-five cases. The project, however, did not mature. In July, 1747, special wards on a separate floor were set aside at the Middlesex for married lying-in women, followed in 1749 by the establishment of the Lying-In Hospital in Brownlow Street, Holborn, and in 1750 by the City of London Lying-In Hospital in Aldersgate Street. But these likewise were for married women only.—Peachey: *Proc. Roy. Soc. Med.* **17**:73 (Aug.) 1924.

THE VALUE OF BLOOD CHEMISTRY IN PREGNANCY *

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WASHINGTON, D. C.

This study in chemical examination of the blood [1] in pregnancy was begun with the idea that, by a systematic monthly blood examination, we might be enabled to discover some finding that would give warning of impending toxemia, possibly before the onset of clinical evidence. Accordingly, a number of patients, when they presented themselves for engagement for confinement, were started on the routine examination,

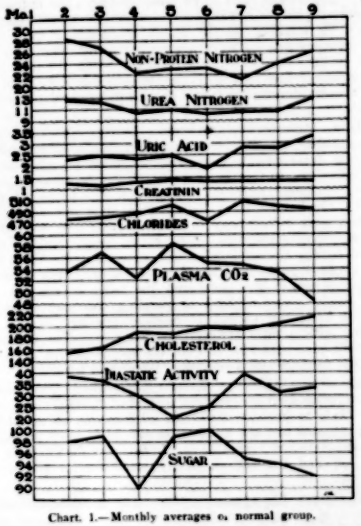

Chart. 1.—Monthly averages of normal group.

which was repeated monthly. In the series, we observed fifty-two patients who had normal pregnancy and normal labor. However, there were in this group a number with only one examination, because of the inaccessibility of the laboratory. The results of our observations in this group of normal cases are given in Table 1. In Chart 1, we have plotted the curves of the monthly averages of this normal group.

For the second and third months there were only six estimations, but for each of the succeeding months there were from nine to twenty.

* From the laboratories of the Naval Medical School.

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

1. The technic for the chemical examination of the blood essentially followed that of Folin and Wu, including Whitehorn's method for chlorids, and is based on whole blood, except for plasma carbon dioxid. We also used essentially Bloor's method for cholesterol, Van Slyke's for carbon dioxid combining capacity (plasma carbon dioxid), and Winslow's for diastase. The results are expressed as milligrams per hundred cubic centimeters, except for plasma carbon dioxid (per cent. by volume) and diastase (Winslow's empiric units). The precise details of each determination will be found in Edition 7 of Stitt's Practical Bacteriology, Blood Work and Parasitology.

TABLE 1.—*Findings in Normal Cases*

Case Number	Date of Examination	Month of Pregnancy	Nonprotein Nitrogen	Urea Nitrogen	Uric Acid	Creatinin	Chlorids	Carbon Dioxid, per Cent.	Cholesterol	Diastatic	Sugar
1	9/16/21	2d	28	13	1.3	1.2	0.480	....	115	16	100
	9/23/21	2d	..	..	..	..	....	....	..	..	..
	10/18/21	3d	28	14	1.8	1.2	0.480	49.3	133	16	125
	11/17/21	4th	23	14	1.5	1.3	0.490	....	123	16	88
	12/16/21	5th	30	10	Tr.	1.4	0.540	57.7	..	..	100
	1/25/22	6th	22	8	1.4	1.4	0.520	57.7	195	64	107
	2/18/22	7th	18.7	8.3	1.8	1.3	0.511	55	209	16	94
	3/16/22	7th	25	13	4.6	1.3	0.520	52.8	185	32	65
2	9/21/21	1st	..	..	..	..	....	....	..	..	..
	10/21/21	2d	22.5	12	2.6	1.3	0.460	51.49	181	16	125
	1/20/22	5th	23	9	1.7	1.2	0.490	60	278	32	80
	2/20/22	6th	22	8	2.2	1.4	0.520	47.5	334	8	88
	3/21/22	7th	19	8	3.4	1.2	0.540	48.2	278	16	94
3	10/18/21	3d	21	9	2.3	1.0	0.470	50.1	166	16	125
	11/18/21	4th	21	9	Tr.	1.2	.....	50.4	133	..	94
	1/14/22	6th	..	13	2.28	..	0.429	50.8	..	..	80
4	11/ 9/21	6th	18	11	2.2	1.5	.....	57.6	133	16	125
	12/ 9/21	7th	22	7	2	1.1	0.480	50.7	167	64	71
	1/13/22	8th	26	10.5	2	1.2	0.480	55	187	75	75
5	11/15/21	3d	28	12.5	2.9	1.1	0.440	59.7	....	128	88
	1/ 6/22	5th	24	16	2	1.6	0.460	57.2	185	32	80
	2/ 6/22	6th	21.5	12.5	1.5	1.2	0.530	61.7	238	..	100
	3/21/22	7th	20	9	4	1.2	0.510	57.7	238	16	88
6	10/17/21	4th	28	15	2.1	1.3	0.440	52.2	190	16	107
7	9/10/21	6th	26	13	2.0	1.4	.....	53	111	16	107
8	9/21/21	6th	28	15	2.1	1.2	0.480	....	190	16	150
9	12/ 6/21	2d	20	14	2.8	1.3	0.490	50.6	167	64	82
10	9/26/21	2d	25	15	1.3	1.1	0.490	67.3	133	16	129
11	11/ 2/21	8th	28	10	1.2	1.5	0.480	53.0	221	32	115
12	9/18/21	6th	27	13.5	2.1	1.1	1.47	65.5	....	16	93
	9/26/21	6th	..	..	..	..	....	....	..	..	..
	10/18/21	7th	..	..	..	..	.....	....	..	..	..
	11/ 2/21	8th	24	10.7	2.9	1.6	0.480	56.8	167	64	107
	11/30/21	9th	..	..	..	..	.....	....	..	..	..
13	1/ 6/22	5th	26	15	Tr.	1.2	0.490	49.4	..	16	107
14	9/28/21	6th	28	14	1.8	1.2	0.51	65.5	145	..	93
15	10/12/21	5th	23	14	2.5	1.3	0.51	50.5	133	32	107
	11/14/21	6th	19	9	1.7	1.1	0.490	56	....	64	111
	12/30/21	7th	30	14	1.5	1.2	0.490	53.2	....	64	100
16	10/ 1/21	7th	27	12.5	3.7	1.5	0.58	59.8	266	32	100
17	11/30/21	6th	18	6	1.9	1.5	0.510	58.6	167	16	83
	12/19/21	7th	30	12.5	22.8	1.7	0.490	54	170	64	100
	1/18/22	8th	21	9	2.3	..	0.490	57.5	..	..	83
18	9/29/21	5th	20	13	1.6	1.4	0.54	48.6	222	16	58
	11/ 3/21	7th	23	8.5	2.9	1.2	.....	54.9	....	..	136
	12/ 2/21	8th	21	6	1.3	1.1	0.520	50.2	278	32	107
19	10/13/21	5th	25	14	3.5	1.3	0.520	55.1	190	..	93
20	10/13/21	4th	30	11	3.3	1.4	0.480	55.1	....	..	115
	11/17/21	5th	26	12	1.9	1.3	0.450	58.6	190	16	94
	12/30/21	6th	29	..	1.3	1.3	0.420	48.2	..	..	128
	2/10/22	8th	26	8.5	3.7	1.2	0.490	58	238	16	125
21	11/16/21	3d	21	10	2	1.1	0.440	52.9	....	..	71
	1/ 5/22	4th	22	10	2.5	1.1	0.460	48.5	278	64	100
22	9/30/21	8th	22.5	12	2.9	1.3	0.49	48.5	190	32	75
	10/12/21	9th	22	12	2.8	1.3	0.44	50.1	190	16	88
23	10/10/21	8th	30	17	2.8	..	0.51	50.6	190	16	116
24	10/25/21	5th	20	11	1.7	1.2	0.470	52.2	....	32	93
25	11/ 1/22	8th	20	..	Tr.	1.3	0.500	57	208	..	88
26	7/26/22	5th	30.2	2.4	1.1	0.490	56	....	32	80
27	4/ 7/22	8th	23	11	2.0	1.3	0.520	67	208	16	79
28	10/ 6/21	5th	22	8	2.8	0.8	0.490	50	147	..	107
	11/ 7/21	6th	21	9.4	2.2	1.6	0.490	58.7	....	12	125
	12/ 8/21	7th	18	9	4.7	1.3	0.510	48.3	....	..	80
	1/ 7/22	8th	20	8.3	2.5	1.5	.....	49.4	185.5	16	107.1
	2/11/22	9th	21	6.5	4.3	..	0.480	50.4	223	16	107
29	10/ 8/21	6th	23	12	1.2	1.1	0.490	49.67	166	16	100
	11/14/21	7th	27	10	2	..	0.460	53.2	141	64	82
30	1/27/22	3d	25	13	Tr.	1	0.510	55	151	32	80
	5/ 2/22	4th	20	10	Tr.	1.7	0.510	49.3	208	8	79
31	10/ 7/21	6th	19	9	....	1.2	0.480	....	166	16	100
	11/ 7/21	7th	19	9	2.5	1.2	0.490	....	167	32	114
	12/ 8/21	8th	21	9	5.7	1.3	0.450	59.6	222	64	75
32	12/ 5/21	4th	19	6	2.5	1.2	0.490	53.6	151	32	94
	1/10/22	5th	20	6	2.7	1.5	0.520	56	167	16	100
33	10/11/21	6th	21	9	1.8	1.2	0.49	51.2	190	..	93
	11/17/21	7th	21	10	2.5	1.4	0.450	53.8	....	..	107
	12/21/21	8th	..	12	2.3	..	.....	47.7	....	..	157
34	10/13/21	7th	26	11	3.2	....	0.500	81.3	191	..	125
	11/13/21	8th	22	11	3.2	....	0.410	55.1	140	25	80
35	10/ 6/21	4th	..	..	..	..	....	....	..	..	..
	10/13/21	4th	22.5	11	2.5	1.2	0.480	51.3	190	..	88
36	11/18/21	4th	23	10	2.5	1.2	0.490	55.1	147	16	79
	12/20/21	5th	28	..	1.9	1.1	0.520	52.2	..	..	100
37	1/23/22	3d	22	14	2	1.4	0.510	60.4	152	32	107
	3/30/22	5th	25	13	5	1.3	0.570	53	....	8	150
38	1/17/22	6th	25	9.5	Tr.	1.3	0.490	60.7	227	16	88
	2/28/22	7th	22	9	6.2	1.0	0.490	58.5	208	8	115
39	8/ 1/22	6th	21	11	1.1	1.1	0.520	42	238	32	83
40	7/27/22	8th	22.5	8.3	2.2	1.2	0.540	50.4	208	64	84
41	7/26/22	3d	23	10	1.3	1.1	0.510	40.3	208	32	88
42	8/ 8/22	5th	24	10	2.5	1.3	0.570	....	208	32	75
43	9/19/22	5th	25	11	1.9	1.5	0.470	....	151	16	91
44	1/18/22	8th	23.7	9.5	2.3	1.3	0.480	54	208	16	91
45	9/29/21	7th	25	17	1.9	1.3	0.490	44.9	199	64	65
46	11/17/21	8th	15	11	2.2	1.3	....	50.3	....	..	109
47	8/ 4/22	4th	25	9	Tr.	1.5	0.530	54	208	32	71
48	10/ 1/21	9th	28	15	Tr.	1.6	0.440	40.8	190	64	75
49	8/ 8/22	6th	25	10	2.3	1.1	0.512	....	..	64	83
50	12/ 7/21	3d	22.5	10	4	1.5	.....	50	167	64	100
51	7/21/22	7th	20	12	2.2	1.2	0.520	55.1	167	32	101
52	9/27/22	7th	22.5	10.7	2.6	1.5	0.490	48.5	238	32	88

As compared with the normal nonprotein nitrogen range, from 25 to 30 mg. per hundred cubic centimeters, our curve is interesting, though it bears out the generally observed and accepted finding; that is, a lower content than is found in nonpregnant women. We see here the high point, 28 mg. per hundred cubic centimeters, during the first trimester, when clinically, the patient is most uncomfortable, adjustment not yet having taken place. Clinically, in the second trimester, we are accustomed to finding tranquillity and comfort. We likewise here observe the greatest stabilization in the nonprotein nitrogen curve, indicating the least disturbance in metabolism, even though it reaches its lowest ebb during this trimester. The last trimester again gives evidence of some disturbance, and a gentle elevation, as we might naturally expect, though even here our average reading, 26, is just about the low normal level.

Urea nitrogen, as found also by numerous other observers, runs a fairly level course, with very slight variations, and is always well within the normal limits, from 10 to 15 mg. per hundred cubic centimeters, and in general bears the accepted ratio to nonprotein nitrogen, 50 per cent. or less.

The normal uric acid content is accepted to be from 2 to 4 mg. per hundred cubic centimeters. In our curve there is seen a steady gradual climb from 2.3 to 3.8 mg. per hundred cubic centimeters. This distinct climb, especially in the last trimester, to the upper normal border, we regard as a most significant finding.

With respect to creatinin, whose normal range is from 1 to 2 mg. per hundred cubic centimeters, we find practically a straight line throughout pregnancy, with little, if any, variation from 1.3 to 1.4.

In the chlorids curve there is a slight gradual rise from start to finish, but well within normal bounds, from 0.470 to 0.500 mg. per hundred cubic centimeters.

The carbon dioxid combining power curve shows a definite downward trend, reaching a trifle below its low normal, 53 per cent. by volume, and this evidently indicates a condition bordering closely on mild acidosis.

Next to the interesting uric acid observation, our most significant finding is the pronounced steady incline in the cholesterol curve. The normal content of cholesterol is given as from 140 to 170, though slightly higher in pregnancy. Our observations found it beginning at 155, and ending at the termination of pregnancy at about 220.

The curve for diastatic activity is higher than the accepted limits, and there is a decided sweep downward in the middle trimester, for neither of which have we a satisfactory explanation.

Though there are distinct wide sweeps in the sugar curve, which, likewise, we cannot explain satisfactorily, the trend is distinctly downward, but always within normal boundaries. We did not note hyperglycemia, as have some reporters.

As noted above, these curves represent the average in each month, but in some individual cases there were findings often bordering on abnormality (Table 1).

We think that the most significant observation in this series of normal cases is noted in Chart 2. Here is seen the almost parallel course of the curves of uric acid and cholesterol, which may open up a field for conjecture. It is not unreasonable to assume that the steady increase in the uric acid, especially in the last months of pregnancy, is indicative of an added strain on the kidneys; and, if this is granted, then there is a potential tendency toward mild toxicity even in normal pregnancy. We have ample authority for stating that cholesterol possesses antitoxic properties, so it would seem that here we have a protective agency counterbalancing the toxicity as evidenced by the uric acid, simultaneously developing its forces throughout pregnancy and becoming stronger as confinement is approached, when it may be much needed.

The practical application suggested from this observation is that it would be a wise measure to prescribe a diet rich in cholesterol during the latter part of pregnancy, especially in those cases showing clinical evidence of a tendency toward toxicity at the same time that proteins are restricted.

That the cholesterol content of the blood may be increased or diminished by food has been clearly demonstrated by Georgine Luden of the Mayo Clinic, in experiments on herself. She enumerates, as being likely to increase the blood cholesterol, cream, butter, mushrooms, egg yolks, alligator pears, oatmeal, salmon, black bass, olive oil, codliver oil and other fats.

We have not done work along this line, but trust that the suggestion may stimulate some one to institute such an investigation.

It is interesting, though possibly of no significance, to note that Case 7 gave the lowest cholesterol reading,

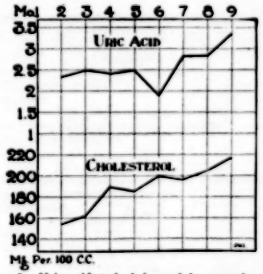

Chart 2.—Uric acid and cholesterol in normal cases.

111, at the sixth month. This patient, following a long labor at term, developed puerperal septicemia and was very ill for a long time, but recovered.

Our pathologic series comprises seventeen patients, presenting symptoms of toxemia, varying from mild toxicity to convulsions with deep coma. In Case 62, the patient came under observation at the second month, and we were able to obtain eight estimations. Most of the others were ward patients, admitted to Columbia Hospital on account of toxemia, and had not been previously studied. Three cases were in 1921, five in 1922, four in 1923, and five in the present year.

In Table 2 are given the toxemia cases. Under A, we have grouped the eclampsia cases. The five patients grouped here all presented clinical symptoms of classical explosive eclampsia: edema, high blood pressure, albumin, casts, convulsions and coma. Yet, in all these cases, the findings in the chemical examination of the blood are within normal bounds, and follow-up reports show that there are no resultant renal impairments. Patient 53, in 1921, was admitted at term in convulsions, and the blood was obtained within less than one hour of a convulsion. Both she and the child recovered. In 1922, she went through a normal pregnancy and labor, and is now having another apparently normal pregnancy. April 20, 1924, her blood pressure was 120

systolic, and 80 diastolic; urinalysis was normal. Patient 56 was admitted March 31, 1924, at the eighth month in convulsions, clinically eclampsia, but the laboratory reported normal blood findings. The patient died following a cesarean section, and the pathologist reported that the liver showed changes typically found in eclampsia with terminal acute nephritis, the liver lesions being the predominating factor. Patients 54 and 55 both were admitted at term with symptoms of classical eclampsia, but, in both, the blood was normal on chemical examination; both patients recovered, and blood pressure and urine were normal on discharge. Case 57 might be classified possibly as preeclampsia, for labor was induced at the eighth month on account of headache, visual disturbance, edema, albumin and casts, and the blood pressure, which was 210 systolic and 130 diastolic; but the blood was normal. There is no evidence of renal inpairment existing at present.

TABLE 2.—*Findings in Patients with Eclampsia and with Nephritic Toxemia*

Case No.	Date	Month of Pregnancy	Symptoms	Blood					Result	Present Condition
				Nonprotein Nitrogen	Urea	Uric Acid	Creatinin	Cholesterol		
				A. ECLAMPSIA						
53	9/20/21	Term	Admitted in convulsions	20	7	2.7	1.3	275	Recovery, mother and child; normal pregnancy and labor one year later; now having normal pregnancy	Blood pressure, 220 systolic, 80 diastolic; urine normal
54	9/29/21	Term	Admitted in convulsions	24	16	2.5	1.5	277	Recovery, mother and child	Blood pressure and urine normal on discharge
55	3/28/24	Term	Admitted in convulsions	28	11	3.8	1.3	197	Recovery, mother and child	Blood pressure, 120 systolic, 80 diastolic; urine normal
56	3/31/24	Eighth; primipara	Admitted in convulsions	30	12	3.4	1.5	209	Cesarean section; died; at necropsy, liver showed findings typical of eclampsia, terminal acute nephritis	
57	8/ 9/22	Eighth	Headache; dizziness; visual disturbance; blood pressure, 210 systolic, 130 diastolic second pregnancy, first normal	30	15	2.4	1.3	278	Recovery; induced labor	Blood pressure and urine normal
				B. NEPHRITIC TOXEMIA						
58	3/24/24	Seventh	Two normal pregnancies; 1 miscarriage, February 1923 at fourth month; well up to three weeks ago, since then vomiting; edema; albumin	160	112	12	5	229	Died; necropsy revealed cause of death to be purulent nephritis	
59	1/12/24	Seventh	Blood pressure, 270 systolic, 162 diastolic; albumin and many hyaline and granular casts; edema, etc.; three pregnancies, two stillbirths	60	30	5.5	1.4	234	Premature baby; died in a few minutes	Blood pressure, 224 systolic, 130 diastolic; heavy trace albumin; hyaline casts
60	1/26/23	Sixth	Blood pressure, 170 systolic, 100 diastolic	30	10	4.4	1.2	228	Premature labor, eighth month; baby, 3 pounds 10 ounces, died second day	Urinalysis, albumin; blood pressure, 130 systolic, 80 diastolic
61	8/ 4/22	Eighth	Blood pressure, 220 systolic, 130 diastolic; albumin 30; many casts; quadripara, two stillbirths	41	18	6.6	1.4	228	Premature delivery; baby 8 months, weight 3 pounds; died in 50 hours	Blood pressure, 170 systolic, 100 diastolic; albumin in urine
62	12/ 1/22 (Eight estimations beginning at second month)	Seventh	Blood pressure, 200 systolic, 140 diastolic; chorioretinitis; first pregnancy; convulsions	23	7.1	4.7	1.6	238	Premature delivery; baby died third day	Blood pressure, 200 systolic, 140 diastolic; albumin
63	7/24/22	Eighth	Toxic symptoms; blood pressure, 198 systolic, 130 diastolic; albumin 50; granular and hyaline casts; three previous stillbirths	32	16	4.1	1.3	206	Died; no necropsy	
64	10/13/21	Term	Blood pressure, 210 systolic, 124 diastolic; edema; toxic convulsions	25	12	6.2	1.3	...	Normal delivery	Unable to trace
65	3/19/23	Eighth		24	13	6.2	1.6	228	Stillbirth	Unable to trace
66	10/29/23	Seven and one half	Blood pressure, 182 systolic, 98 diastolic; edema	32	13	3.8	1.6	239	Cesarean section; recovery of mother and baby	Blood pressure, 150 systolic, 70 diastolic; trace albumin; headache; backache; edema
67	11/ 8/23	Term	Convulsions	32	14	4.3	1.9	...	Recovery of mother and child	Blood pressure, 130 systolic, 65 diastolic
68	3/24/24	Seventh	Marked edema; blood pressure, 190 systolic, 116 diastolic; albumin; casts	30	12	4	1.4	209	Recovery of mother; baby died in a few hours	Blood pressure, 130 systolic, 70 diastolic; albumin present
69	3/ 1/22	Eighth	Marked edema; blood pressure, 180 systolic, 140 diastolic; albumin; casts	32	13	3.3	1.3	278	Mother recovered; stillbirth	Second pregnancy, with normal labor at term, December 1920, but with blood pressure 150, albumin and casts

Close scrutiny of cases grouped under B, nephritic toxemia, in Table 2, shows quite different blood chemistry pictures. Every case shows nitrogenous retention of varying degree. We are unable to trace two cases, 64 and 65. In each of the others, however, by follow-up, we have been able to demonstrate that a kidney lesion of variable intensity existed later, in a few cases as late as two years; and that, in all probability, in these cases the kidney lesion was the predominating factor in the causation of the toxemia.

Patients 59 and 61, from the clinical picture and by the present condition, each having high blood pressure and albumin and casts, are definitely nephritic with marked renal impairment. In these cases, the blood shows pronounced nitrogenous retention.

Patient 58 was profoundly toxic when admitted, the nature of the toxemia not being known, though it was not thought to be eclampsia. This view was confirmed at necropsy, which demonstrated the kidneys as the predominating lesion. Here, too, we have the chemical findings in the blood excessively high.

In Case 63 a necropsy was not obtained, but the history and the clinical picture clearly indicated that the toxemia was of nephritic origin, and here also the chemical examination of the blood showed a definite increase in nonprotein nitrogen and uric acid.

Patient 62 was known to have nephritis before this pregnancy in 1922, and we made eight chemical examinations of the blood during and immediately following the pregnancy, which terminated spontaneously at the seventh month. In each estimation, although the nonprotein nitrogen was low, the uric acid content was always high. This patient's present blood pressure, 200 systolic, 140 diastolic, is sufficient evidence that renal impairment exists.

In Case 60, the symptoms were not at all explosive, but throughout pregnancy there were constantly present evidences of smoldering mild toxemia. A previous pregnancy terminated with a stillbirth at the sixth month. In the patient's present condition, she is far from being robust, with blood pressure 130 systolic, and 80 diastolic. The nitrogenous contents of the blood were at the upper normal boundary, with the uric acid well over the border.

In Cases 66, 67, 68 and 69, the blood findings are not pronounced, but in each case the figures are around or just over the upper normal boundary, and the examination of these patients last month gave strong suggestive evidence that mild renal impairment still persists in each.

In this series of pathologic cases, it will be noted also that the cholesterol values are uniformly high. Again, we may assume that the cholesterol as a protective agency, as in the normal series, is being reenforced to exert its beneficial action in the face of such toxicity.

Chart 3 presents the average findings in our series. It will be seen how little difference there is between the graphs in the normal cases and eclampsia, and what a wide difference there is between eclampsia and nephritic toxemia. It, of course, must be emphasized that these graphs are based on our small series, and that possibly a larger series might give quite different diagrams.

Studying each report as it was made in this pathologic series, it was difficult to see that we were receiving any aid from this investigation. But by grouping the cases and by careful follow-up examinations, and then by viewing them at long range, as it were, we were amazed to see the exceptionally low blood chemistry estimates in the frank, undoubted cases of eclampsia. On the other hand, we were struck by the observation that some of the patients presenting toxic symptoms, but in whom convulsive seizures did not seem to be in the least imminent, showed, on chemical examination of the blood, a decided nitrogen retention. Thus, we feel that we have been aided by the chemical examination of the blood together with the clinical picture and the follow-up examination, months later, in classifying these toxic cases into eclamptic and nephritic toxemia.

We realize that this will be criticized, on the score that previous investigators have reported many series in which they show marked evidence of nitrogen retention in eclampsia. Our response to this, however, is that we have carefully studied all such published reports in the Surgeon General's Library, but in none of them has conclusive evidence been adduced to show that the cases reported were not in reality nephritic. To quote these reports in support of this position would carry us far beyond our allotted space.

The analysis of this series of pathologic cases, though not, of course, sufficiently large in number to warrant making any dogmatic declarations, yet gives, we believe,

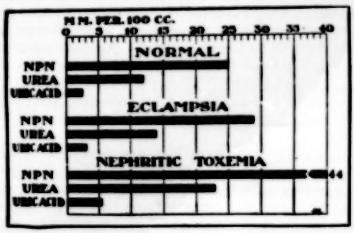

Chart 3.—Average findings.

findings suggestive enough to enable us to advance the following tentative observations:

1. Eclampsia probably does not produce any appreciable change in the blood chemistry.

2. If, in a case of toxemia of pregnancy, the blood shows decided nitrogen retention, either in the nonprotein nitrogen or in the uric acid, it is strongly suggestive that nephritis is the predominating factor in the toxemia.

ABSTRACT OF DISCUSSION

DR. J. P. GREENHILL, Chicago: Similar studies were made at the Chicago Lying-In Hospital in more than fifty cases of late toxemia of pregnancy. While no attempt was made to differentiate cases of nephritic toxemia from those of other forms of toxemia, and while studies were made on those that were definitely eclamptic, no more information was given to us by the blood chemistry studies than we obtained clinically. The only frequent positive finding was an increase in the uric acid content of the blood. In the patients who were very toxic, there was a definite increase in the uric acid content, and a number of these patients died. The creatinin, urea nitrogen and nonprotein nitrogen were practically normal, regardless of the mildness or severity of the toxemia. The blood sugar in all the toxemic patients studied was practically normal.

DR. JOSEPH J. MUNDELL, Washington, D. C.: As I tried to state, we did not make any dogmatic conclusions, but it seemed that we were aided in differentiating between eclamptic and toxemic subjects.

SOME POINTS IN THE PHYSIOLOGY OF SMOOTH MUSCLE AND ITS NERVE REGULATION *

CHARLES W. GREENE, PH.D.
AND
C. D. BONHAM, A.B.
COLUMBIA, MO.

For test preparations we use the uterus of the rat; also segments of the rat's small intestine, chiefly the duodenum. The use of the rat's uterus for physiologic and pharmacologic purposes has been quite limited, although it is admirably adapted to the purposes. The rabbit and the guinea-pig have heretofore been the standard animals for this type of experimentation, but preparations from the rat are better.

Isolated segments of the rat's uterus, prepared by taking the horn and half the body of the organ, and mounting the right and left preparations in duplicate, constitute unique test preparations. The segment should be mounted in a balanced mammalian salt solution, kept at body temperature, and constantly and evenly oxygenated. We have set up the preparations in Harvard warm chamber tubes, so arranged that a change of solution can be promptly and deftly made without disturbing the tension conditions. These tubes are mounted in a large water bath, kept at even temperature by a circulating system. Air has been used for aeration rather than pure oxygen, and has been thoroughly satisfactory. The rat's uterus gives, normally, about one contraction in two minutes, with superimposed variations at a faster rate of from one to three a minute.

The rat's uterus preparations are delicately sensitive to oxygen want. If a balanced saline solution deprived of its gases is substituted for aerated solutions, or if the aeration system is shut off, so that the oxygen in solution in the preparation tube is not renewed, then a normally contracting uterus promptly ceases peristaltic and also pendular contractions, if they are occurring. The tonic contractions of the preparation rapidly decrease, and a condition of extreme relaxation ensues.

If oxygen want is removed by a renewal of aeration, the uterus very promptly regains its fundamental rhythm, its pendular movements and its general contraction tone. Almost always, these preparations, following such a period of oxygen want, show an increased volume of contraction over the preceding normal period.

The rat's duodenal segment, treated by the conventional method used for the guinea-pig and rabbit by Cannon, or by Stewart and Rogoff, almost immediately displays two types of contractions when mounted in a balanced salt solution. The one is the very regular segmentation type, which, in the record, is almost as rhythmic as cardiac movements, and contracts at a rate of about sixty a minute. The other type is that of peristaltic movements. These movements are sometimes complicated by pendular movements. If the aeration of this preparation is stopped, it, too, immediately relaxes, loses tone and becomes quiet. Sometimes slight segmental contractions continue for a time, but not always. On renewing aeration, the intestinal preparation quickly enters into a strong tonic contraction, with superimposed peristalses.

The particular point to be emphasized in this connection is the fact that the majority of these preparations are much more strongly and tonicly contractile after a period of asphyxiation than in the normal. Oxygen want does more than simply deprive the preparation of the means for its normal metabolism. Whether by-products from incomplete oxidation, or whether other effects are left, the net result is a hypersensitive preparation.

Physiologic effects of variations in the salines in artificial solutions are known chiefly through studies of cardiac tissue, and to a lesser extent of skeletal and smooth muscle tissues. The rat's uterus and the intestinal segment are extremely sensitive to changes in the proportion of salts in a balanced solution. The important salts are, as in the heart, calcium and potassium. If an artificial solution containing 0.9 per cent. sodium chlorid, and 0.026 per cent. calcium chlorid is substituted for the balanced solution, the peristaltic contractions of the uterus increase in number, sometimes in amplitude, but not always, and the tissue is thrown into a more persistent contraction tone. These changes are most constant when the temperature and aeration are constant. If the sodium chlorid solution containing calcium chlorid is now balanced by adding the usual amount of potassium chlorid of blood serum, the immediate effect is a complete relaxation and loss of rhythm for a few seconds only, followed by a reestablishment of rhythm and of more vigorous contraction amplitude than before. This seems to be a constant reaction phenomenon.

If, on the other hand, the salt solution consists of 0.9 per cent. sodium chlorid and 0.03 per cent. potassium chlorid, a different cycle of changes ensues. The tonic contractions gradually disappear, and the rhythm diminishes, but usually does not wholly disappear for a long time, many minutes. The balancing of the solution by adding the necessary calcium salt in this case leads at once to the reestablishment of strong, vigorous contractions of the prenormal amplitude or greater.

Isotonic sodium chlorid alone will not support vigorous contractions of either the uterus or intestinal preparation from the rat. The most important change under the influence of sodium chlorid alone is a profound relaxation of tone.

These observations are certainly of significance to the clinical aspect of disturbances in both the alimentary canal and the uterus and its appendages. In circulatory stasis or respiratory inadequacy, in conditions of chronic anemia, or in the local conditions of intussusception or strangulation, or other sources by which the oxidation of the tissues is reduced below the normal level of efficiency, it is obvious that we may expect profound disturbances in the regulation and activity of the alimentary smooth muscle and of the muscle of the urogenital system. It would seem that the factor of saline balance is of equal importance in the alimentary mechanisms and in the urogenital musculature as in other better known regions of the body. Calcium treatment, as recently stressed, involves this alimentary muscle factor.

The control of the automatic movements of the alimentary canal has been elucidated largely by the epoch-making work of Carlson and by numerous workers in his laboratories. The anatomic work of Kuntz has done much to help us understand the nerve relationship in the intestines, while Ranson's work of the last few years has clarified the field of the autonomic nerve mechanisms, not only of the alimentary canal but of the body in general.

* From the Department of Physiology, University of Missouri School of Medicine.
* Read before the Section on Pathology and Physiology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

In isolated uterine and intestinal segments, we believe that the operative local conditions are essentially the same as those that hold in the body. Of course, the central nervous influences are eliminated. In the segment preparations, we always have the problem as to whether the movements are nerve controlled or inherently muscular. This problem has not thus far been satisfactorily solved. However, the nature of the response is better understood when we consider the behavior of the organ under certain well known specific drugs. We have the impression, from the character of response in experiments, that the effects, both of asphyxiation and of unbalanced salt solutions, on the intestinal segment and the uterus of the rat are largely a response to the influence of these conditions on the intrinsic nerve mechanisms. The chief basis for our belief is the promptness of the onset of the response and of its elimination in the recovery stages. It is scarcely conceivable that these movements should be carried out without greater disturbances of coordination within the preparation, if muscle alone is the agency through which asphyxiation and the salines act.

This view is strengthened when we test the preparation against drugs, and we would mention for illustration digitalis, which has scarcely received adequate recognition for its influence on the motility of the alimentary canal. Duodenal segments respond somewhat inconstantly to digitalis. Sometimes the contractions are inhibited as promptly as though extrinsic inhibitory nerves were stimulated. Again, the contraction rhythm is rapidly augmented and the tone is increased. These differences depend on the concentrations of digitalis used on the segment. Weaker doses inhibit, while toxic doses always stimulate the intestine to vigorous contractions.

Velyien Henderson has recently emphasized the importance of such drugs as pilocarpin, and especially physostigmin, in this relation. He advocates the use of physostigmin to remove alimentary inactivity, cautioning against the extreme toxicity of this drug. Physostigmin augments the rhythm and amplitude of the segmental contractions of the duodenal preparations, stimulating the parasympathetic and enteric nerve endings. The type of response is quite comparable to that occasionally observed under stronger digitalis.

These drugs, especially digitalis, also react on the uterine preparation. The contractions are augmented. The rat's uterus lends itself to testing by such well known drugs as epinephrin, ergot, histamin, ergotoxin and barium chlorid. Under each of these, the response of the rat's uterus is so prompt and pronounced and characteristic that one can scarcely escape the view that it is nerve initiated rather than directly muscular. Even barium chlorid, which has come to be accepted in the literature as a direct stimulator of smooth muscle, belongs in the nerve classification just given. Henderson has argued that it is somewhat gratuitous to charge the vigorous contractions of smooth muscle under barium chlorid to direct muscle influence alone. Barium salts, like digitalis, not only stimulate the terminal tissue but often produce greater changes by stimulating the nerves controlling the tissue.

CONCLUSION

We emphasize the underlying metabolic conditions and the mechanisms controlling the reactions of smooth muscle in such complicated organs as the alimentary canal and the urogenital system. Laboratory experiments on asphyxiation, on balanced salt solutions, and on pharmacologic preparations give a more tangible basis for interpreting the physiology underlying not only the normal, but also the pathologic conditions that clinicians must combat.

ABSTRACT OF DISCUSSION

DR. J. M. FRAZIER, Belton, Texas: We are taught that muscle tissue is divided into three kinds, and that the heart muscle fiber differs from the others in not having the sarcolemma. Incidentally, in examining the human heart muscle fiber, I found one with sarcolemma, and became much interested in the development of muscle fiber. I examined the hearts of accessible living animals, domestic and from the zoo, and found more fibers with a sarcolemma in the rabbit and in lower forms of animals, such as the bat. Textbooks state that there is no sarcolemma. Looking up the bibliography of this subject, I found that a German, F. N. Winkler, reported he had found a sarcolemma in the human heart muscle fiber. I believe that a sarcolemma ordinarily exists as an anomaly in the heart muscle fiber. If it did exist in the human heart, the subject, had he known it, could have controlled his heart action. There have been such cases. It is also known that hypnotists can control heart action in a favorable subject. I do not know in which hearts they are able to do that. Ordinarily, it is an involuntary muscle. The anomaly in the heart would be a reversion to a lower form of animal life.

DR. CHARLES W. GREENE, Columbia, Mo.: Whether we assume the colloidal emulsoid theory of the nature of the living protoplasm or not, clinicians will have to recognize that the variations in the saline balance influence the functional activity of these peripheral motor tissues. Part and parcel of the same process is a change in responsiveness of the same tissues to nerve regulation, and nerve coordination and nerve control.

CEREBRAL MALARIA

REPORT OF AN UNUSUAL CASE

OTTO TIEMANN BROSIUS, M.D.
BARRANQUILLA, COLOMBIA

To those who have had experience with tropical malaria, the protein nature of this disease is only too well known. Its syndrome, its wide range and its variation of symptoms and signs, together with its complex symptomatology are as complicated as those of syphilis, and it is as dangerously imitative of symptoms and syndromes of other maladies, for which reasons it is not always one of the easiest diseases to eliminate in a difficult differential diagnosis in tropical medicine.

Many self-explanatory names have been assigned to the various forms of pernicious type of subtertian or estivo-autumnal malaria, such as hyperpyrexial, the delirious and comatose, the aphasic, convulsive, tetanic, epileptiform, apoplectic, general paralytic, meningeal, and the cerebellar and bulbar types. In 1917, I[1] reported a case presenting all the signs of anterior poliomyelitis. Various psychoses and memory disturbances, as well as impairment of good judgment and reasoning, have been directly attributed to cerebral malaria. The case under discussion is still a new and distinctive type, involving and complicating two of the forms named above.

REPORT OF CASE

A boy, aged 10, a mulatto and a native of Colombia, was brought into the hospital of the Pato and Nechi Mines, Colombia, Ltd., March 23, 1924, in a semiconscious state with convulsive seizures, screaming frantically at spasmodic

1. Brosius, O. T.: Cerebral Malaria, J. A. M. A. 68:106 (Jan. 13) 1917.

intervals. Obtaining a family history or a past history of this type of patient is usually difficult, and this case proved to be no exception to the rule, save that the patient was known to have had several attacks of fever previously.

Regarding the present illness, his mother stated that the child had not been to school for three days because he had had a slight fever and headache, associated with a peculiar drowsiness; but, believing it not to be serious, she administered home remedies of herbs and decoctions of various kinds. About two hours before his admission to the hospital he became suddenly very ill, with a high fever and convulsions, and soon became unconscious.

The child was well developed and well nourished and was in a state of opisthotonos and even orthotonos. His head was retracted, and his eyes rolled constantly upward. These signs, with intermittent tonic spasms preceded by frantic cries after which a typical risus sardonicus would be assumed, caused us to search most carefully for some wound or abrasion, or some sort of infection, without result. Dermographia was present, and, between spasms, the orthotonos relaxed sufficiently for us to try the Kernig sign, which was markedly positive. The patient did not regain consciousness between attacks. His temperature on admission was 38.8 C. by axilla, and the pulse was 108. A clonic spasm usually, though not always, followed the tonic convulsions, and any handling whatsoever of the patient, whether during examination or in the giving of treatments, brought on the loud terrified cries with a fearful upward rolling of the eyes, followed by the spasmodic attacks. There were no paralyses. The rigidity of the neck persisted even during the intervals between the convulsions.

Further physical examination revealed otherwise negative findings of the region of the head, neck, scalp, ears, nose and mastoid. The pupils were equal and normal, and reacted to light. There were no glandular enlargements. The teeth were generally in bad condition, and the tongue bore a thick, whitish coat.

Dermographia was the only unusual feature presented by the skin, which was otherwise perfectly clear, but also hot and dry. Petechiae could easily have been obscured by the color.

The heart and lungs were normal, but the respirations were deep and labored, and at times stertorous and irregular, and the pulse beats, though regular, were full and strong.

The enlargement of the spleen, which was hard, down to the umbilicus was the only positive finding in the abdomen.

The knee reflexes were both increased during relaxation in the intervals between the convulsions.

A blood smear, taken immediately after the physical examination, and stained by Hasting's method, showed the presence of both the malignant and benign tertian parasites. The hemoglobin was 70 per cent., and a white blood count simultaneously made was 11,200. A differential white blood count showed: polymorphonuclear neutrophils, 48.5 per cent.; large mononuclears, 18.5 per cent.; large and small lymphocytes, 29.5 per cent.; eosinophils, 3.5 per cent.

An intravenous injection of 6 grains (0.4 gm.) of quinin dihydrochlorid was given immediately and repeated twice that day, after four hour intervals. That evening the temperature rose to 39.2 C. by axilla.

The following day, March 24, a slight amelioration of symptoms was noted, in that the convulsions and the frantic cries did not occur so frequently. The temperature by axilla ranged between 37.8 and 38.8. Because the neck still remained rigid, and the head retracted, a lumbar puncture was done and some of the fluid, which was clear and under pressure, was drawn off. The cell count was 5 to the cubic millimeter. Three more intravenous injections of quinin dihydrochlorid, of 6 grains (0.4 gm.) each, were again administered at six hour intervals.

The temperature by axilla, on the morning of March 25, was 37.6 C., and did not rise above 38.2 that day. The quinin was administered in the same way as on the preceding two days. There were no more convulsions, and the patient spoke a few words and took a little broth, although a slight rigidity of the neck still persisted, as well as an accompanying retraction of the head. The frantic cries, as well as the tonic spasms followed by the clonic convulsions, had discontinued after the lumbar puncture.

By the morning of the fourth day, March 26, the patient had regained complete consciousness. The temperature also had fallen to normal and, save for a slight pain in the upper spine, there was a complete cessation of all signs and symptoms. The urine was normal, but a stool examination showed the presence of *Ascaris lumbricoides*, for which the patient was treated at a later date. Quinin dihydrochlorid was now given by mouth, three times a day, in 6 grain (0.4 gm.) doses, for six days more. Then 5 grains (0.3 gm.) was given three times a day for ten days, after which, for ten days more, 5 grains (0.3 gm.) was given mornings and evenings. Thereafter a tonic was administered.

The case is illustrative of the fact that blood smears should be examined in almost every case in tropical lands, and that cerebral malaria should not be too quickly eliminated in a difficult differential diagnosis.

Pato Mines, Apartado 104.

Clinical Notes, Suggestions, and New Instruments

TWO CASES OF AMYOTONIA CONGENITA OCCURRING IN THE SAME FAMILY

GERALD R. ALLABEN, M.D., ROCKFORD, ILL.

These two cases of this rather rare condition are of interest owing to the fact that heredity, or a familial tendency, has not been noted in the cases heretofore reported.

REPORT OF CASES

CASE 1.—M., a boy of normal delivery, born in the summer of 1920, breast fed, at the age of 6 months was brought to the hospital by the mother, who complained that he made no effort to raise himself, and was unable to sit up. She stated that he nursed normally and seemed cheerful, and that he had been gaining rapidly in weight, and had had no digestive disturbance.

The baby was large, bright and happy in appearance. There was inability to sit up, or even to hold the head up unsupported. He was able to move the hands and feet a little, but offered no muscular resistance to attempts at passive motion. There existed, apparently, a hypertrophy of the muscles of the extremities, with a flaccid condition of all the muscles. Knee jerks were absent. Sensation to pain was apparently normal. Electrical reactions were not tested at this time, but, later, tests showed characteristic decrease in contractility. Blood examination showed: hemoglobin, 70 per cent.; red blood cells, 4,848,000, and white blood cells, 12,000; no abnormalities were noted in the differential count, or examination of the blood smear. A specimen of urine was negative. The Wassermann test was reported anticomplimentary, although, later, the Wassermann reaction was reported negative. Roentgen examination of the spine was negative; the chest showed an unusually wide aortic shadow, and there was a suggestion of some enlargement of the thymus gland. There was no clinical evidence of aneurysm.

The father and mother were well. There were two girls under 6 years of age, both normal, with the exception of the presence of a marked strabismus in the younger. One boy had died at the age of 16 months, with symptoms described by the mother as identical with those evidenced in this case, although the death certificate had been signed as a tuberculous meningitis. The Wassermann reaction of the father was reported as doubtful, and of the mother, as negative, although later Wassermann tests were reported negative in both cases. A later report on the family history stated that the mother had a definite anaphylactic reaction to dandelion, and that her mother suffered from hay-fever. The child's mother had also been subject to attacks resembling paroxysmal tachycardia.

A diagnosis of amyotonia congenita was made. Later, the child was examined elsewhere. Radium was advised to reduce the size of the thymus gland, and he was given one exposure. A short time later, the child contracted pneumonia, and promptly died. No necropsy was obtained.

CASE 2.—Another boy was born to these parents, June 22, 1922. Dr. A. G. Athens, Buhl, Minn., who was in attendance, reported that the delivery was normal; easy labor lasted eight and one-half hours, the position being left occipito-anterior. After ten days, the mother and child left the hospital in good condition. Five months later, the baby showed a disinclination to use the legs and arms, and to hold the head up. This weakness gradually increased, though the child continued to gain in weight, and was apparently otherwise perfectly well. There were no signs of atrophy, nor were the cranial nerves involved. Knee jerks and all other deep muscle reflexes were absent. The Babinski reflex and the Kernig sign were negative. The family objected to blood and spinal fluid examinations. There was no doubt about this being a case of Oppenheim's disease.

The mother, in her desperation, turned to Christian science, and the child died a few months later.

It is worthy of note that these two cases, and possibly a third, all occurred in male children in the same family, whereas, two female children in the family showed no signs of the disease.

ATYPICAL MUMPS

WILLIAM L. GOULD, M.D., ALBANY, N. Y.

Recently, a woman, aged 20, married, came to me complaining of pains and swelling in the left side of the body. Three weeks before, she became ill. On arising one morning, she was seized with headaches, dizziness, nausea and pains in the back, legs and abdomen. Within twenty-four hours, the left side of the body became painful, tender and swollen. On examination three weeks later, at my office, there was found a typical acute inflammation of the left parotid gland. The left breast was painful, tender and somewhat indurated. The left upper and lower extremities were generally, but moderately, tender and swollen. The swelling was more acute for the first week. The affected parts had constant, cramplike pains, and were not discolored. On the nineteenth day after the onset, the tongue became swollen, this condition lasting throughout one night. The pains in the epigastrium, which came especially after meals, the nausea, belching and, also, the "awful headaches and dizziness" lasted through the illness. After four weeks of ailing, the patient made an uneventful recovery. All signs and symptoms disappeared fairly rapidly in the last two days. At no time was the patient confined to bed.

Two weeks previous to the onset of the illness, the patient's sister had a typical attack of mumps.

This case is atypical and unusual in that but one parotid gland was attacked, with a complicating metastasis to almost the whole of the same side of the body, the opposite side remaining entirely free.

203 Madison Avenue.

PHENOL POISONING FROM INK

CAREY P. MCCORD, M.D., AND DOROTHY K. MINSTER, A.B.,
CINCINNATI

E. M., a girl, aged 18, a shoe worker, was brought to us, July 10, with multiple second degree burns on her face, neck and breasts. The patient stated that her work was the numbering and lettering of pieces of leather used in the manufacture of shoes. In opening a bottle of the marking ink, she splashed a liberal quantity over her body. Water and a common alkali soap were used in an attempt to remove the ink stains.

When seen by us, the patient, in addition to extensive burns over the major portion of her face, neck and chest, was depressed, weak and suffering from a headache, and presented an increased heart rate with a feeble pulse. Her condition of collapse was out of proportion to the extent of external injury. An odor of phenol (carbolic acid) was present on the patient's clothing, and it was established that this was the characteristic odor of the ink employed. Following this information, treatment, both local and general, was instituted with resulting early recovery.

A subsequent investigation led to the finding that concentrated phenol is widely used in the manufacture of marker inks. Phenol serves as an excellent solvent for the pigment employed, and, in addition, is valuable for its etching effect in the marking of substances, such as smooth leather, that do not readily "take up" ink. The concentration of phenol in the specimen examined was sufficient to produce injury readily if applied to the skin of the worker. The extent of the injury in this reported case was probably increased through the action of the alkali water used to remove the stains, as under such conditions hydrolysis takes place, intensifying the harmful properties of phenol.

Should this kind of marker ink come into extensive use, there will exist a definite occupational disease hazard calling for precautionary measures.

34 West Seventh Street.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

PITUITARY SOLUTION-WILSON (See New and Nonofficial Remedies, 1924, p. 229).

The following dosage form has been accepted:

Ampoules Pituitary Solution-Wilson, 0.5 Cc.

THIOSINAMINE.—Thiosinamina.—Allyl Sulphocarbamide.—Rhodaline.—$(NH_2).CS.NHCH_2.CH:CH_2$.—Allylthiourea.

Actions and Uses.—Thiosinamine is being used against arsphenamine dermatitis (Thiosinamine in the Treatment of Arsphenamine Dermatitis, S. S. Greenbaum, J. A. M. A. **83**:38 [July 5] 1924). This use is still in the experimental stage.

Thiosinamine was originally introduced to promote the absorption of scar-tissue, lymphatic swellings, etc. Clinical opinions as to its efficiency are contradictory; but its restricted use indicates that it has little, if any, value for this purpose.

Although it is usually well borne, except for the bitter taste and acid eructations, it may produce toxic systemic effects (digestive disturbance, lassitude fever, J. A. M. A. **56**:835 [March 18] 1911); and these may set in suddenly after it has been used for a time without toxic effects. In animals, relatively small doses produce severe changes in metabolism and parenchymatous degeneration but without evidence of connective tissue changes. Larger doses impair respiration (Tyrode: *Arch. Internat. Pharmacol.* **19**:195, 1910).

Dosage.—Against arsphenamine dermatitis, Greenbaum recommends 0.2 Gm. dissolved in 6 Cc. of distilled water, with the addition of 1 or 2 drops of a 2 per cent. solution of glycerin, injected daily, by vein.

Thiosinamine occurs as white, glistening prismatic crystals, having a garlic-like odor and bitter taste. It melts at 70 to 74 C., forming a colorless liquid, but at higher temperatures it yields white vapors, alkaline in reaction to moist litmus paper, and a carbonaceous residue. It is soluble in water (1 part in 17 parts of water), freely soluble in alcohol (1 part in 2 parts of alcohol); not so soluble in ether. Thiosinamine is hydrolyzed by water.

Boil 1 Cc. of the saturated aqueous solution with 1 Cc. of sodium hydroxide solution for two minutes; acidify with acetic acid and add 1 Cc. of lead acetate solution; a black precipitate of lead sulphide forms.

Add 3 Cc. of mercuric chloride solution to 1 Cc. of the saturated aqueous solution; a white precipitate forms; when heated in the test tube to boiling over a bunsen flame, no discoloration takes place. Add 1 Cc. of mercurous nitrate solution to 1 Cc. of the aqueous solution; a gray precipitate forms, which, on making the solution ammoniacal, turns yellow, then dark again. Add drop by drop 0.5 Cc. of silver nitrate solution (2.5 per cent.) to 1 Cc. of the saturated aqueous solution; a milky white precipitate forms; then add slowly 3.5 Cc. of silver nitrate solution; the precipitate first dissolves in excess of the reagent, then a voluminous white or brownish white precipitate forms; heat the test tube containing the precipitate over a bunsen flame; a silver mirror forms on the glass.

Ignite about 2 Gm. of thiosinamine, accurately weighed; the ash should not be more than 0.05 per cent.

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SATURDAY, SEPTEMBER 13, 1924

WATER BY MOUTH FOR FEVER IN THE NEW-BORN

Clinicians have been somewhat slow to appreciate in a practical way that water is required in the body not only for the urinary elimination of waste products but also for the removal of heat. The latter phenomenon of itself involves the continued elimination of a considerable amount of water, which takes place even though it may necessitate a desiccation of the body tissues and fluids. Loss of water by evaporation from the respiratory tract and mouth is inevitable, unless the air inspired is saturated with water vapor at body temperature. A large portion of the body heat is usually dissipated by evaporation of water from the skin, the amount removed in this way varying widely according to the environmental conditions. As Marriott[1] has pointed out, severe anhydremia is especially likely to occur in infants. This is due in part to the fact that they have a high water requirement, which must be covered. Furthermore, the infant is entirely dependent on others for water administration, and may be offered an insufficient amount. Newly born infants, nursing at the breast and receiving no fluid from other sources, frequently become somewhat desiccated, owing to an insufficient water intake. In any infant, the presence of infection is likely to lead to refusal of food, vomiting and diarrhea, with a resulting anhydremia.

When the blood and tissues become concentrated by water loss, the amount of water available for evaporation is diminished, and, as Marriott has further suggested, ultimately becomes less than that required for removal of the heat of metabolism. Fever then occurs. On this basis, the fever occasionally encountered in new-born infants has been explained, although it should be said that not all writers are willing to assign anhydremia as the sole cause of the high temperature. However, various pediatricians have reported that the febrile temperature can be lowered readily by administration of water. According to Bakwin, Morris and Southworth[2] of Cornell University Medical College, New York, whereas in afebrile new-born infants, the protein concentration of blood serum is fairly constant, usually lying between 6 and 7 per cent., in the new-born with fever, the serum proteins are generally above 7.5 per cent. and often over 9 per cent., indicating a marked diminution in the plasma water. When fluid was given orally (usually by gavage) to the new-born exhibiting febrile temperature, in the proportion of from 30 to 40 c.c. per kilogram of body weight, a prompt fall in the temperature and blood concentration followed with great regularity. The temperature usually reached normal within from thirty to ninety minutes. When the fluid was given hypodermically or intraperitoneally, the effect on the temperature and blood concentration was neither so marked nor so regular as after water by mouth.

The greater efficacy of the oral administration of water deserves emphasis at a time when all sorts of parenteral routes are frequently chosen for the introduction of remedial agents into the body. There are unquestionably times when intravenous injections are life-saving, or subcutaneous medication is imperative; but we are in danger of forgetting how excellent and prompt absorption may be from the alimentary tract that Nature has primarily provided for such a function.

Water drinking is not a cure-all. Water given by mouth, in amounts similar to those used in the new-born with fever, has practically no effect on the temperature of infants with fever due to various infections. Yet, according to Bakwin, Morris and Southworth, even in older infants, dehydrated as a result of severe diarrhea, fluid by mouth was much more effective in reducing the concentration of the blood than fluid given by hypodermoclysis or intraperitoneal injection. Simple methods should not be overlooked merely because clinical technic has succeeded in adding many new operative procedures to the possibilities of practice.

1. Marriott, W. M.: Anhydremia, Physiol. Rev. 3:275 (April) 1923.

2. Bakwin, H.; Morris, R. M., and Southworth, J. D.: The Effect of Fluid on the Temperature and Blood Concentration in the New-Born with Fever, Am. J. Dis. Child. 27:570 (June) 1924.

THE NEWER STUDY OF PANCREATIC FUNCTION

For many years the chemical diagnosis of abnormalities of the pancreatic function lagged far behind that of the gastric activities. The reasons for this are not far to seek. Since the introduction of the stomach tube, the withdrawal of gastric contents, under a large diversity of conditions, for chemical examination has become comparatively easy, and has accordingly entered the domain of clinical application. To this has been added the advantage of roentgen-ray observations that supplement the other types of evidence regarding gastric conditions. The development of the use of the duodenal tube for securing the mixed secretions that pour into the upper intestinal tract has furnished a new

procedure for studying the secretions of the pancreas and the liver, and has thus brought them in closer range for the consideration of possible deviations from the normal. The judgment of the adequacy of the pancreatic functions, so far as they affect the digestive processes, is thus no longer limited to data derived from a study of the stools.

Of late, it has become comparatively easy to study the enzyme concentrations of the duodenal contents obtained by the use of the gastroduodenal tube. The position of the latter can be verified by fluoroscopic observation, and the fluids withdrawn by siphonage. Through examination of material obtained in this way, McClure and his collaborators [1] at the Evans Memorial, Boston, have found abnormalities in enzyme concentration only in the presence of some lesion involving the pancreas, either primarily or secondarily. Hence, it is concluded that such analyses of duodenal contents furnish an index to the activity of the external secretory function of the pancreas. Measured by estimates of enzyme concentrations of such contents, this secretory activity was found to be much depressed below normal in chronic pancreatitis. Acute pancreatic necrosis, cancer of the head of the pancreas, and lesions obstructing the pancreatic duct were accompanied by marked abnormalities in the enzyme concentration of duodenal contents. Obstructive lesions caused great diminution, while acute necrosis often caused dissociation of the concentration of the enzymes. Estimations of the sort referred to appear to be of aid in obstructive jaundice, in localizing the site of the lesion, and in the differential diagnosis between its benign or malignant character.

McClure has observed a time coincidence of the onset of the flow of bile and of pancreatic juice. This suggests a common stimulant process. His findings in normal persons indicate that the essential factors in eliciting the secretion are the products of digestion. In the Boston tests, evidence of pancreatic stimulation was much less pronounced after the drinking of water than after the ingestion of foodstuffs. This finding occurred in spite of the fact that water stimulates the secretion of acid gastric juice; so that, after its ingestion, acid fluid was ejected from the stomach into the duodenum. From this it is concluded that something more than the mere ejection of acid contents into the duodenum is necessary materially to stimulate pancreatic secretion. It was demonstrated also that a relation existed between the degrees of enzymic concentration and the kind of foodstuff ingested; while, on the other hand, no relation was found between the magnitude of enzymic concentration and the degree of acidity of the duodenal contents. The findings, therefore, present evidence that the acidity of the duodenal contents is not the essential factor causing the stimulation of pancreatic juice in man.

It will be noted that such a conclusion appears to speak against the "secretin" theory of pancreatic stimulation formulated by Bayliss and Starling, and now commonly taught as a fundamental feature of alimentary physiology. According to this theory, acid reaching the duodenum promotes the formation of secretin from the walls of the intestine, the secretory hormone thereupon being carried in the blood stream to the liver and pancreas, which are incited to activity. Perhaps current views require some modification, if the experience of McClure and his associates secures further substantiation; at any rate, they already feel justified in asserting that the work supporting the "secretin" theory furnishes only indirect evidence of the correctness of that theory, while phenomena urged in its support can all be explained in other ways.

1. McClure, C. W., and collaborators: Studies in Pancreatic Function, The Enzymic Concentrations of Duodenal Contents in Health and Disease, Am. J. M. Sc. 167:649 (May) 1924.

CIRCULATORY AND RESPIRATORY ADJUSTMENTS TO HEMORRHAGE

Physicians do not need to be reminded of the preeminent importance of oxygen for the maintenance of the bodily functions. Recent developments in the arts and practices of man have served to emphasize the life-sustaining rôle of the element in the eyes of the layman as well as the trained biologist. The aeroplane, which has become capable of ascents to a height of more than seven miles into the atmosphere, where the partial pressure of oxygen is greatly reduced, brings the aviator face to face with the problem of anoxemia. The mountaineer who attempts to scale the heights of a Mount Everest is also reminded that the barometric changes involved in ascension leave him to cope with a relative shortage of oxygen. When the contacts with the rarefied air are made slowly, compensatory adjustments become possible and an acclimatization may occur, so that life still remains possible without the aid of artificial respiratory devices at heights above 20,000 feet, for some persons. In most persons subjected to rapid changes of altitude or its respiratory equivalent, however, Schneider [1] has observed that a crisis occurs when the altitude is about 19,000 feet above sea level, which is an equivalent of an atmosphere containing only 10.16 per cent. of oxygen. A large number of persons show appreciable effects at 14,000 feet, or 12.28 per cent. of oxygen—as one might find conditions in Pike's Peak. Before such a degree of deficiency is reached, the tendency to anoxemia may be compensated by an increased respiratory volume, a faster pulse, a rise in both the systolic and the pulse pressure, and a moderate fall in diastolic pressure.

Anoxemia is likely to occur under conditions in which the oxygen carrier, hemoglobin, rather than the oxygen itself is decreased in amount. This may happen in hemorrhage. The loss of blood, however, not only

1. Schneider, E. C.: Physiol. Rev. 1:631 (Oct.) 1921.

initiates a reduction in its oxygen-carrying capacity but also involves the loss of a certain amount of nutrient plasma, so that volume changes are induced. It is conceivable, therefore, that such a depletion would be far more serious for the body than uncomplicated reduction of the external oxygen pressure. In a study of the oxygen consumption during hemorrhage, it was observed [2] that there is no marked decrease until bleedings of about 1.5 to 2.5 per cent. of the body weight have occurred. The circulatory respiratory crisis does not arise until approximately one fifth of the total blood volume has been removed. Thus, even when the important requisite hemoglobin to maintain compensation is lacking, physiologic adaptations ensue after considerable hemorrhages before there is a crisis in the mechanism. As happens in an attenuated atmosphere, the danger of anoxemia is averted by an altered rate of blood flow and by increased ventilation of the lungs. Increased pulse rate and increased respiratory depth are characteristic responses to "anemic anoxemia" as well as to other forms of partial oxygen deprivation.

BLACKWATER FEVER AND MALARIA

With the growing invasion of the tropics and the subtropics by the white man, attention has become increasingly directed to many diseases that are characteristic of these regions. This is true, for example, of blackwater, or hemoglobinuric, fever, a malady that has for its prominent symptom the passing of blood pigment into the urine. Some writers regard it merely as a manifestation of certain severe types of malaria, which accounts for the use of the designation "malignant malarial hemoglobinuria" in parts of the South for what is evidently blackwater fever in Africa. It is not surprising, however, that this disorder should be regarded by certain investigators as one that is specific and independent of malaria. Thompson [3] has reminded us that although the latter, in its different clinical forms, was known and described by Hippocrates, no recognizable description of hemoglobinuric fever has been found to exist prior to the middle of the nineteenth century.

It becomes necessary from time to time, therefore, to consider anew the assertions of those who insist that blackwater fever is a disease of recent origin and a condition that is *sui generis*. It has been argued, for example, that the seasonal incidence of malaria and blackwater fever differs, and that hence they cannot logically be regarded as interrelated disorders. Only a large number of carefully compiled statistics will warrant compelling deductions of this sort, and most of these have favored the interpretation that the two diseases have approximately the same period of greatest intensity. This was true for the Panama Canal Zone in the days when the Isthmian Canal Commission was active; and Thompson has recently discovered the relationship between malaria and blackwater fever as regards seasons to be very definite in southern Rhodesia, where he has had large opportunities to study the situation.

It has been argued, in favor of a duality of the diseases, that the malarial parasites are not always found in cases of blackwater fever. The failure to discover these etiologic agents in a blood film taken from a patient exhibiting the clinical symptoms of malaria does not mean, however, that he is free from the parasites. Various investigators have called attention to the absence of parasites from the peripheral blood in cases afterward definitely proved to be malaria. Thompson has found this to be particularly the case in Rhodesia in infections of the malignant tertian type. In fact, he believes that the species of parasite most concerned with blackwater fever is the malignant tertian; and that in those cases in which benign tertian and quartan parasites have been found, they acted only as the excitant of the attack without being the primary causal factor in the production of the hemoglobinuric fever condition. In Africa, the geographic distribution of blackwater fever is certainly associated, if we may trust Thompson's statistics, with those areas where tropical malaria, i. e., *Plasmodium falciparum*, predominates, and where the endemic index is high.

None of the attempts to discover a specific causal organism, other than the malaria parasite, for blackwater fever have succeeded in establishing the claims for any length of time. The hypothesis of a spirochetal etiology that had certain symptoms like jaundice to commend it has failed to meet critical tests; although Thompson ventures to suggest the possibility that syphilis, relapsing fever or acute infective jaundice might, in the presence of malaria, act as an exciting cause of blackwater fever. There is no autolysin detectable comparable to that occurring in paroxysmal hemoglobinuria. All these conclusions have a direct bearing on the problem of treatment. They speak with renewed emphasis for the preeminent importance of antimalarial measures. Nonimmune persons must be taught to respect these. The menace of malaria should be kept before those liable to an attack, and the proper use of quinin should not be neglected. The recent studies in Rhodesia confirm the belief that malignant tertian malaria is most amenable to this drug, and regular administration of it in proper doses results in rapid improvement in the patients. Thompson believes the great error to lie in the fact that patients often stop using quinin on cessation of the acute symptoms; and in most cases after the cessation of treatment they are readily reinfected. It has been abundantly proved that antimalarial measures reduce blackwater fever. No debate of etiologic theories should divert attention from this helpful information at the present time.

2. Schlomovitz, B. H.; Ronzone, E., and Schlomovitz, H. H.: Oxygen Consumption During Repeated Slight Hemorrhages, Am. J. Physiol. **69**: 465 (Aug.) 1924.

3. Thompson, J. G.: Researches on Blackwater Fever in Southern Rhodesia During the Years 1922 and 1923, Proc. Roy. Soc. Med. (Sec. Trop. Dis. and Parasitol.) **17**: 47 (May) 1924.

Current Comment

THE SHEPPARD-TOWNER ACT

The publicity department for the Children's Bureau of the United States Department of Labor announces that $1,688,047.12 has been expended by federal and state governments in the carrying out of the Sheppard-Towner Act, or the so-called federal Maternity and Infancy Act, during the first fifteen months following its passage. The federal grants to the states have totaled $1,046,523.56, and the state appropriations $641,523.56. Forty-three states cooperated in 1922, and forty-one states in 1923. The number for 1924 includes forty. The states that do not cooperate are Kansas, Illinois, Louisiana, Vermont, Maine, Massachusetts, Connecticut and Rhode Island, but Louisiana is to come in during 1925. Since this bill was strongly opposed by the medical profession before it was passed by Congress and endorsed by President Harding, it is in order to inquire as to just what has been accomplished through the expenditure of this large amount of money. Perhaps it is well to quote exactly what the publicity department for the bureau has to say; the claim is made that this act has demonstrated its value since it has:

1. Stimulated state activities in maternal and infant hygiene.
2. Maintained the principle of local initiative and responsibility.
3. Improved the quality of the work being done for mothers and babies by disseminating through a central source—the federal government—the results of scientific research and methods of work which have been found to operate successfully.
4. Increased state appropriations with the passage of the act. From the appropriation for the fiscal year 1922, fifteen states were able to accept only the $5,000 unmatched funds. Six states were able to accept only the $5,000 unmatched from the federal appropriation for the fiscal year 1923. All of the states cooperating under the act either have already accepted more than the $5,000 unmatched allotment from the 1924 federal appropriation, or will be able to do so. Moreover, since the Maternity and Infancy Act became effective, thirty-three states accepting it have made definite increases in their own appropriations for the welfare of mothers and babies.

Actually, the first three items just quoted mean nothing. They represent no scientific evaluation of results, but merely the general statement that more attention is being paid to the matter without evidence of paternalism. How is it demonstrated that this act, which is essentially paternalistic, has "maintained the principle of local initiative and responsibility"? The fourth claim made means even less from the standpoint of benefit, since one of the chief charges against this act was that it forced the states to appropriate money in order that they might receive an equal share of federal funds. It is strange, then, that the claim should be made that one of the benefits of the act has been that the states have been forced to appropriate money which, by the very nature of things, they could hardly avoid appropriating. If the proponents of the Sheppard-Towner Act would justify the bill, they must submit exact figures indicating that the maternal and infant death rates have been appreciably lowered in those states which have cooperated with the federal government, and that the rates are much lower than those obtaining before this meddlesome legislation became effective, and lower also than those of the states which have not cooperated, and which may serve in this case as a control. Furthermore, recognition should be made of the tendency toward lowering of maternal and infant mortality rates in accordance with the general lowering of all mortality rates following increased application of our knowledge of sanitation and hygiene.

THE HYDROGEN ION CONCENTRATION IN THE DUODENUM

It is not long since the custom prevailed of referring to the reaction of the tissues and body fluids in general terms. Thus, one was taught that the gastric juice is strongly acid whereas the intestinal juices are distinctly alkaline. Gastric contents have been removed for chemical examination with great frequency since the introduction of the stomach tube. The reaction of the intestinal contents was for a long time merely inferred from the known reactions of the pancreatic, biliary and enteric secretions that pour into the lumen of the alimentary canal. Obviously, the admixture of acid gastric chyme as it is discharged into the duodenum through the pylorus is likely to modify the reaction of the intestinal contents; and when the duodenal tube came into vogue, the examinations of the aspirated contents indicated that widespread variations may occur. McClure, Wetmore and Reynolds[1] of Boston, for example, determined the reaction of the duodenal contents removed from normal men after the ingestion of meals consisting of practically pure fat, carbohydrate or protein, or mixtures of these. As the result of their observations, they state that the contents were acid after the ingestion of protein and mixtures of food substances, and alkaline after an intake of fat and carbohydrate foods. The actual figures varied from p_H 3.17 to p_H 8.10, the reaction of water being approximately p_H 7.0. As the progress of biochemistry has demonstrated that small differences in hydrogen ion concentration may be responsible for pronounced differences in the character of chemical or biologic reactions in the body, the importance of the subject will become at once apparent. Lately we have heard much about the effect of small changes in reaction on the growth or inhibition of acidophilic or of proteolytic bacteria in the bowel. The various digestive enzymes are notably sensitive to small variations in hydrogen ion concentration, which have been the subject of considerable controversy regarding the persistence of salivary and gastric enzymatic activities in different regions of the intestine. Unusual interest is therefore attached to the direct electrometric determinations of the hydrogen ion concentrations made in the human duodenum by insertion of an electrode through a fistulous opening. In this way, Hume, Denis, Silverman and Irwin[2] of New Orleans observed a maximum value of p_H 8.23 and a minimum of p_H 5.90. No definite differences in reaction were

1. McClure, C. W.; Wetmore, A. S., and Reynolds, L.: New Methods for Estimating Activities of Duodenal Contents of Normal Man, Arch. Int. Med. 27:706 (June) 1921.
2. Hume, H. V.; Denis, W.; Silverman, D. N., and Irwin, E. L.: Hydrogen Ion Concentration in the Human Duodenum, J. Biol. Chem. 60:633 (July) 1924.

observed to be dependent on the type of meals ingested. These figures, obtained without a duodenal sound, represent lower acidity values than have been reported by others. They suggest to the New Orleans investigators that the presence of a tube in the pylorus may cause the sphincter to remain open longer than when no foreign body is present, thereby allowing larger portions of gastric contents to enter the duodenum than are usually passed under more natural conditions, and thus producing greater fluctuations in reaction in the duodenum than the direct observations have now revealed. It is significant that the average of these records was p_H 7.02, essentially a neutral reaction.

COOPERATIVE PLAN IN MEDICAL EDUCATION

The College of Medical Evangelists, of Loma Linda, Calif., is introducing a plan of cooperative work in the teaching of medicine similar to that which has been carried out in the College of Engineering of the University of Cincinnati. The freshman class for the forthcoming session will be divided into two sections; while one section is engaged in classroom work the other will be engaged in practical work in certain hospitals, laboratories and dispensaries, including work in hydrotherapy, massage and other such tasks for which their knowledge of medicine qualifies them. During the following month the two sections will alternate, the first doing the practical work while the second will carry the regular classroom work. It is planned that eventually this arrangement can be carried throughout a five year course. The plan has been adopted, first, because the results of the present day medical curriculum are not as satisfactory as desired and, secondly, to make it possible for a student to support himself to a greater extent while engaged in the study of medicine. The experiment will be watched with interest, since it gives promise of restoring to medical students to some extent the benefits derived from the preceptor system of earlier days. The plan is an experiment in medical education, the results of which may help to solve some of the problems connected with it.

NATURE OF THE BLOOD SUGAR

Organic chemists have in recent years considerably enlarged our knowledge concerning the chemical structure of carbohydrates and the configuration of their molecules. The stereo-isomeric manifestations of the more familiar sugars have, of course, long been recognized; indeed, so far as they involve the optical properties of sugar solutions, they are taken into account whenever the physician uses a polariscope for diagnostic purposes. Other equally subtle structural features of the sugars have only lately been appreciated. For example, there is evidence that glucose can exist in a relatively stable form—the α-β-glucose—and also as a highly reactive isomer—γ-glucose. The attempts to explain the functions of insulin in the metabolism of the carbohydrates have been directed at many biochemical reactions that may proceed in the organism. Several of the hypotheses have already been tested in experimental ways and found wanting. Winter and Smith[1] of Cambridge, England, have advanced the interesting suggestion that the sugar in normal blood is present in the unstable form of γ-glucose—hence, its ready susceptibility to metabolic transformations. In severe diabetes they conceive the blood sugar to exist as the more stable α-β-glucose. The cause of diabetes is thus sought in the absence or inactivation of an enzyme having the function of transforming the stable form of glucose to the more reactive type. As might be expected, biochemists have not delayed in testing a theory having such interesting metabolic implications. Without reviewing the experimental evidence in detail, it may suffice here to note that the major thesis of Winter and Smith has failed of satisfactory corroboration. According to Denis and Hume[2] of New Orleans, for example, proof of the existence of γ-glucose in normal blood is lacking. Unless it can be supplied in the face of indications to the contrary, it will be more profitable to turn to other possibilities in explanation of the way in which insulin facilitates the utilization of glucose in the body.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ALABAMA

Milk Control in Birmingham.—As a result of a four-year campaign to improve the milk supply, 75 per cent. of the milk used in Birmingham is pasteurized. Prior to 1919, the milk averaged a bacterial content of almost a million bacteria per cubic centimeter, and according to the chief of the food and dairy division of the health department, half of it was adulterated, the citizens paying $94,000 a year for the water thus used. A milk code, adopted in November, 1919, was to have become effective, April, 1920, but an injunction procedure prevented its enforcement for more than a year. An agreement was reached in July, 1921, by the department of health to reinstate milk control on the basis of the original ordinance modified so that instead of adopting the bacterial content of 60,000 per cubic centimeter, to be enforced at once, a sliding scale was arranged gradually reducing the bacterial limit from 500,000 per cubic centimeter to a final standard of 50,000 bacteria per cubic centimeter over a period of twelve months. Since October 31, 1922, the bacterial content of special raw milk and special pasteurized milk has been fixed at 30,000 bacteria per cubic centimeter and at a final bacterial limit of 20,000 per cubic centimeter after December 31, 1924. Since the development of milk control in Birmingham, the typhoid death rate has dropped from 65.5 per hundred thousand in 1917 to 7.7 in 1922, and the death rate from colitis among babies under 2 years of age from 185.5 per hundred thousand to 51.6 in 1922. Investigation in the last three months disclosed twenty-six persons employed at dairies who were carriers of typhoid bacilli. There were up to August 1, this year, forty-three cases of typhoid fever reported. Six cases were traced to a single raw milk dairy where two typhoid carriers were found. Almost four times as many people in the city use pasteurized milk as those who use raw milk, yet of thirty-eight consumers of milk who contracted typhoid fever this year, about two-thirds of them used raw milk.

ARIZONA

Personal.—Dr. John T. McDonald, Los Angeles, has been appointed subdistrict medical officer in the Veterans' Bureau station at Phoenix.

1. Winter, L. B., and Smith, W.: J. Physiol. **57**: 100 (Dec.) 1922. Forrest, W. D.; Smith, W., and Winter, L. B.: Ibid. **57**: 224 (March) 1923.

2. Denis, W., and Hume, H. V.: On the Nature of Blood Sugar, J. Biol. Chem. **60**: 603 (July) 1924.

State Board Pamphlets.—The *Bulletin* of the Arizona State Board of Health, July, contains the names of pamphlets on public health and related subjects issued, without charge, by the state board of health. The demand for these pamphlets indicates a constantly increasing interest in health matters. There were distributed, in January, 1,406 of these pamphlets; in March, 12,904; in April, 53,060; the total for the first six months of 1924 was 82,933, which was more than the number for the entire previous year.

CALIFORNIA

College Moves.—The College of the Pacific at San Jose is moving to Stockton where seven new buildings are being completed at a cost of $750,000.

Laboratory Bulletin.—The director of the State Hygienic Laboratory, Dr. Wilfred H. Kellogg, has started the publication of a bulletin for laboratory workers in the state. The bulletin has been planned as a medium for the distribution of information of interest to California laboratories, private, hospital and municipal, and to serve as a connecting link between them. The Hygienic Laboratory desires to assist in the solution of problems of other laboratories and as an example will titrate such agents as amboceptor, antigen and agglutinating sera.

"Beauty Doctor" Arrested.—The state board of medical examiners caused the arrest, August 20, of Margaret Crosse, of the Crosse Laboratories, a beauty parlor at 683 Sutter Street, on a charge of practicing medicine without a license, it is reported. Surgical instruments and pamphlets describing skin treatments to the "crowned heads of Europe" were seized, but the defendant claimed that the instruments were never used by her and that the pamphlets referred to lotions she distributed. Miss Crosse, however, agreed, it is reported, to rejuvenate the face of a policewoman for $150, or to do it surgically for a larger sum.

Chiropractor and Others in Court.—It is reported that the bond of chiropractor Raymond Loyd, San Bernardino, was raised from $1,000 to $5,000 at a preliminary hearing, August 15, on a charge of extortion. The secretary of the state board of medical examiners announced, August 11, the arrest of Christopher Liscum in Castroville on a charge of practicing medicine without a license. R. Thompson Fowler, Oakland, who claimed to have a secret formula "for the cure of tuberculosis," was arrested, August 1, on a charge of practicing medicine without a license. The patient, a woman, aged 19, it is said, had Fowler arrested on the claim that his formula "almost cost her life" instead of improving her illness.

Medical Society Milk Commission.—The San Francisco County Medical Society's milk commission, active since 1907, has been a factor in the extensive growth in the use of certified milk in stores and refreshment places where children are served. Eight hospitals in San Francisco, one cafeteria, and the Stanford Convalescent Home at Palo Alto provide certified milk for children in their institutions. The milk commission of the medical society guarantees to the physicians of San Francisco and environs, reaching from Sacramento to San Jose, a supply of milk of the highest grade. The commission requires a bacterial content in raw milk below 10,000 per cubic centimeter, that no cows be bought for the certified herds except under the tuberculin test, and that the whole group from which the cows came must be tested and show not more than 10 per cent. reactors. The whole herd is tuberculin tested semiannually and reactors excluded at once. The price of certified milk is 25 cents a quart.

COLORADO

Personal.—Dr. Nicholas M. Alter, instructor in internal medicine at the University of Michigan Medical School, Ann Arbor, has been appointed professor of pathology at the University of Colorado School of Medicine, Denver.

State Medical Meeting.—The fifty-fourth annual session of the Colorado State Medical Society will be held in Denver, October 7-9. The first meeting of the house of delegates, Monday evening, October 6, will be in the assembly room of the Medical Society of the City and County of Denver. Members on the scientific program from this state have been requested to limit their papers to ten-minute abstracts which can be elaborated for publication. Among those from other states on the program are Drs. Elliott P. Joslin, Boston; Carl A. Hedblom, Rochester, Minn.; William H. Thearle, M. C., U. S. Army; Lawrason Brown, Saranac Lake, N. Y., and Edwin R. LeCount, Chicago.

ILLINOIS

"Medical Showman" Arrested.—W. L. Ivey, who recently conducted "medicine shows" at Windsor, Strasburg, Sigel and Shelbyville, was arrested at Beecher City, August 20, on a charge of practicing medicine without a license, it is reported. Ivey claimed to be from Roth, Okla., and was released under $1,000 bond.

Clinics for Crippled Children.—Since January, 1921, the state department of health has conducted more than 350 clinics for crippled children at forty-two points throughout the state. A total of 8,228 patients attended the clinics and medical service was given all who were unable to obtain it from private sources. Only 10 per cent. of the children seen were placed in institutions.

"Nature Doctor" Signs Death Certificate.—It is reported that Andrew Curtis, Westervelt, who represented himself as a physician, was arrested, August 23. Curtis signed the death certificate of one of his "patients," erasing the M.D. on the form and substituting after his signature, "N. D." It was found, after an investigation by the coroner, that the patient died of an entirely different disease than that described by Curtis.

Chicago

Medical Post.—The Chicago Medical Post No. 216 of the American Legion will assemble on National Defense Day, September 12, with the medical regiment at 7 p. m. in front of the Newberry Library, North Dearborn and Delaware streets.

Society News.—A special meeting of the Chicago Roentgen Society will be held, September 11, at the Cook County Hospital. Dr. Joseph Aspray, Spokane, Wash., will speak on "A Superior Routine Technic in the Roentgenologic Examination of the Nasal Accessory Sinuses."

Personal.—Dr. Jeremiah H. Walsh, secretary of the Board of Trustees of the American Medical Association, gave an address on the pioneer medical men of Illinois at the annual summer outing of the Jo Davis County Medical Society at Camp Nineteen on the Mississippi River, August 26.

INDIANA

Personal.—Edward Rowlands, Evansville, executive secretary of Evansville College, has been appointed assistant registrar at the Indiana University School of Medicine, Indianapolis.——Dr. Thurman B. Rice has been appointed director of the laboratory of bacteriology and hygiene of the state board of health, to succeed Dr. Alfred G. Long, resigned. Dr. Rice has been a member of the faculty of Indiana University School of Medicine for seven years.

IOWA

Personal.—Dr. Felix J. Scheffler, Onawa, has signed a contract to become county physician for the west half of Monona County. Dr. Adolph J. Lieber, Des Moines, succeeded Dr. Phil Watters as police surgeon, September 1.——Drs. P. G. Pomeroy and W. D. Hall have purchased the Mineral Springs Hospital, Marengo, of Drs. William P. Hutchins and F. F. Winsell.

KENTUCKY

Physician Arrested.—Dr. Grover S. Brzozowski, Louisville, was arrested, August 24, on a charge of operating his automobile while under the influence of liquor, and is being held for the alleged extortion of money from motorists, on a charge of impersonating an officer and highway robbery, it is reported. Complaints filed alleged that Brzozowski stopped motorists on the pretext of violating a traffic law and took $10 and $17, respectively, from them for their release.

LOUISIANA

Instruction in Care of Babies.—The board of health of New Orleans opened an infant care and feeding clinic, August 15, in the municipal building. The clinic, which is in charge of the child welfare division, of which Dr. John Signorelli is the head, will be primarily educational.

Chair of Tropical Medicine.—The Tulane University of Louisiana School of Medicine, New Orleans, has announced plans for the establishment of a chair of tropical medicine. A bequest of $60,000 by William E. Vincent makes it possible to launch this project, and with this benefaction in hand, it is estimated that an additional $70,000 will make possible the creation of a department of tropical medicine.

MASSACHUSETTS

Personal.—Dr. Ranson H. Sartwell has resigned as assistant superintendent of the Worcester State Hospital to become superintendent of the Rhode Island Infirmary at Cranston, R. I.

Hospital News.—A clinic for the treatment of venereal and skin diseases has been started at the Cambridge City Hospital. Dr. Walter T. Garfield is in charge.——The Hampden County Tuberculosis and Public Health Association's Preventorium at Provin Mountain was formally dedicated, August 22. Dr. Parker N. Court, president of the tuberculosis association, presided, and John C. Robinson, donor of the land, presented the deed. The principal speaker was Dr. Eugene Kelly, state commissioner of public health. The preventorium, which is filled to capacity, has accommodations for 104 children.

MICHIGAN

Smallpox in Five Years.—The U. S. Public Health Service reports that Michigan has had 15,384 cases of smallpox in the last five years. In the same period, the state of Massachusetts, with aproximately the same population, has had 114 cases of smallpox.

Infantile Paralysis Holds Up Detroit Schools.—The superintendent of schools of Detroit announced, August 28, that due to the prevalence of infantile paralysis in the city, the opening of the public schools would be delayed until September 15. This action was taken, it is reported, at the request of the health commissioner, who reported there were sixty-four cases of infantile paralysis in the city.

MINNESOTA

Personal.—Dr. Edward W. Fahey, St. Paul, was elected supreme physician of the Knights of Columbus at the forty-seventh convention, recently, in New York City.——Dr. Milton J. Geyman, formerly of Browerville, will take up a fellowship in roentgenology at the University of Minnesota, this fall. ——Dr. Edward C. Gager left for Montreal, August 15, en route to Europe, to be gone for a year.

MISSISSIPPI

Prevalence of Malaria.—Dr. Richard N. Whitfield, Florence, of the state department of health, reports that there were 11,938 cases of malaria reported in the state during July. Malaria was by far the most prevalent disease reported, the next being bacillary dysentery with 2,299 cases; the next, gonorrhea with 1,115 cases reported. There were eleven cases of anthrax in man reported in July.

MISSOURI

Trachoma Clinics.—The state board of health has arranged for a trachoma clinic, to be held at Columbia, September 24-25, by Dr. R. L. Russell, director of the Division for the Prevention of Blindness, in cooperation with a representative of the U. S. Public Health Service. The private railroad car is equipped with facilities for treating trachoma and will be routed to fifteen communities in the state during September and October. Dr. Russell states, it is reported, that clinics have been held in more than fifty counties in the state and that trachoma prevailed to some degree in all of them.

Osteopaths Sue Osteopathic Board.—It is reported that "Dr." A. L. McKenzie and the Central College of Osteopaths, Kansas City, have filed a suit in the circuit court against the osteopathic board for $150,000 damages. The petition alleges that the osteopathic board and its members have conspired to discriminate against the McKenzie school, which it branded as not reputable. "Dr." McKenzie is also president of the Kansas City University of Physicians and Surgeons. He recently lost a suit against the state board of health (THE JOURNAL, September 6, p. 774) in which the court was petitioned to compel the board to accept graduates of the Kansas City University of Physicians and Surgeons as applicants for licenses to practice medicine.

MONTANA

Personal.—Dr. Frances Sage Bradley has been appointed director of the child welfare division of the state board of health during the absence of Dr. Hazel D. Bonness.

NEW JERSEY

Quack Treats Hotel Guests.—Jacques Gordon was arrested at Atlantic City, August 28, on a charge of practicing medicine without a license, it is reported. Gordon had written prescriptions for guests at a prominent hotel where he was stopping. The Atlantic County Medical Society investigated this case.

Nonfatal Epidemics.—According to the *Bulletin* of the department of health of Newark, there were 2,118 cases of German measles in the first six months of 1924 and only 170 cases in the first six months of 1923; also 2,103 cases of mumps as compared with 419 cases in 1923, and 1,180 cases of chickenpox the first six months of 1924, a total of 5,407 cases of acute illness, not one of which was fatal.

NEW MEXICO

Personal.—Dr. Benjamin J. Patterson, Las Vegas, has been appointed part time health officer of San Miguel County to succeed Dr. Michael D. Moran, resigned. The appointment is effective until the first of next year when the matter of returning to a full time basis will be decided.

NEW YORK

State Hospital Opens.—A new state hospital for mental diseases, to be known as the Harlem Valley Hospital, was recently opened at Wingate with thirty-two patients from Long Island institutions. This is the first unit completed in the $50,000,000 program approved at the last election. Dr. John R. Ross, formerly of the Dannemora State Hospital, is superintendent.

Puerperal Sepsis.—The Division of Maternity, Infancy and Child Hygiene of the New York State Department of Health requests the cooperation of physicians in reporting cases of puerperal sepsis. The sanitary code authorizes such reports but there has been laxity in complying with the requirement. From 1920 to 1923, 1,148 deaths were reported as due to puerperal sepsis while only 877 of these cases had been reported before the patients died.

Infantile Paralysis in August.—The total number of cases for the month of August was 200 and the total since June 1, 386. These are the highest figures since 1916 when the corresponding figures were 1,846 and 2,489, respectively. For the week ending August 30 there was an increase of 11 cases over the preceding week. The following places have reported 10 or more cases since June 1: Syracuse, 99; Oneida, 20; Oswego, 19; Buffalo, 12; Fulton, 10, and the town of New Haven, Oswego County, 10.

Typhoid at Port Jefferson Controlled.—The typhoid fever epidemic at Port Jefferson, which has thus far cost three lives, is under control. It has shown, among other things, a need for more extensive health inspection among the neighboring villages, and the Brookhaven town board has appointed a committee to investigate the cost and advisability of adopting a model health code in the township. A code prepared by the state department of health was presented to the board for consideration by Dr. Richard Slee, Rockville Center, a state health officer.

New York City

Personal.—Dr. Robert J. Wilson, director of the bureau of hospitals, department of health, New York City, was presented with an illuminated, autographed token of esteem by the employees of that bureau and the bureau of laboratories, on his recent retirement as director following twenty-eight years of service.——Dr. J. H. L. Cumpston, director-general of health of Australia, who is in this country as a guest of the International Health Board of the Rockefeller Foundation, visited the state department of health at Albany, August 23.

New Hospital for Joint Diseases.—The new hospital will open, October 5, with a capacity of 275 beds, and facilities for treating 1,500 patients a day. The original Hospital for Joint Diseases was established in 1906 with seven beds. The hospital is supported by the Federation for the Support of Jewish Charities and to make it as nearly self-supporting as possible, seventy-five beds will be in private rooms; the remainder will be ward beds. Dr. Henry W. Frauenthal, the founder, will be physician and surgeon-in-chief, Mr. Lewis Strauss, president, and Mr. Oliver F. Bartine, superintendent.

Ambulance Service.—According to a report by the United Hospital Fund, about 42,000 persons have been attended in the last year by ambulances from institutions supported by the fund. A total of more than 125,000 calls were answered

from all New York hospitals that provide ambulance service. Forty general hospitals maintain 100 public ambulances engaged in city-wide service. The municipal hospitals of Manhattan and the Bronx maintain 38 per cent. of the ambulance service and those of Brooklyn 22 per cent. The report states that eight minutes from the time any one in New York City is injured or stricken with illness requiring emergency attention an ambulance is on its way to provide relief.

Children's Welfare Association Seeks Public Support.—This organization has launched a movement to enlist interest in behalf of certain items in the budget. It desires to convince the board of estimate that whatever else may be deleted it cannot afford to begin with sums spent for the welfare of children. The federation urges the appointment of twenty additional school nurses and twenty medical inspectors giving three hours a day, pointing to the present inadequacy. In Queens, for example, school nurses are responsible for 8,576 pupils per nurse. There is also a request for five additional medical inspectors to serve three hours a day in baby health stations now covered by school medical inspectors, and a plea for funds to extend prenatal work. The salaries involved in the enlargement outlined amount to $93,700.

Dispensary Control of Tuberculosis.—Under this title the Association of Tuberculosis Clinics of Greater New York has issued its yearbook, which shows a total of thirty-one tuberculosis clinics in Greater New York. The number of clinics was not reduced in the last year but the number of sessions in the department of health clinics was reduced from one every day with a night session on Saturday, to a session every other day with a night session and a children's session on Saturday, making in all five a week. The Corlears Clinic, which formerly operated at 303 Broome Street, was moved, July 1, to the headquarters of the department of health, 505 Pearl Street. Stuyvesant Clinic, which for three years was at 540 East Thirteenth Street, doubled up with the Yorkville Clinic. Another loss to the upper east side of Manhattan was the closing of the Day Camp, operated by the department of health at the foot of East Ninety-First Street.

NORTH CAROLINA

Impostor Sentenced.—It is reported, that a "Dr." C. Carwell, Jr., pleaded guilty in the superior court at Gaston to forging the endorsement of Dr. O. L. Miller on a bank draft for $150 and was sentenced to not less than four or more than six years in the state prison. In passing sentence, the court informally expressed the opinion that Carwell was an impostor. A negress testified that she paid him $9 a short time ago on a promise to cure her daughter of typhoid fever, and that Carwell claimed to be a doctor "sent out by Uncle Sam."

OHIO

Hospital News.—Structural work has begun on the new U. S. Marine Hospital at Cleveland which will cost about $1,500,000.

Society Honors Veteran Physician.—The Champaign County Medical Society held its annual picnic, August 27, at Ohio Caverns, in honor of Dr. Halbert B. Hunt, St. Paris, who is celebrating his fiftieth year as a practicing physician.

Thyroid Survey of School Children.—The U. S. Public Health Service, the commissioner of health and his associates made a thyroid survey of school children in Cincinnati. The results reported by Olesen (Public Health Reports, July 25) show in sixty-one elementary public and forty-three elementary parochial schools between the first and eighth grades, the kindergarten being excluded, 47,493 children were examined and 15,751, or 32.2 per cent., of the children had thyroid enlargements. Among 23,710 boys, 6,314, or 26.6 per cent., had some degree of enlargement. Among 23,783 girls, 9,437, or 39.8 per cent., had enlargements. Among 2,396 colored boys, 675, or 28.2 per cent., and among 2,671 colored girls, 1,245, or 45.1 per cent., had some degree of enlargement. The greatest prevalence occurred between the ages of 11 and 13 years in both sexes. In 142 instances, representing .09 per cent. of the enlargements, a presumptive diagnosis of adenoma was recorded. These nodular enlargements were distributed to the extent of 45.4 per cent. among boys and 55.6 per cent. among girls. Only one frank case of exophthalmic goiter was noted, and this in a girl, aged 13, who was under medical supervision. Tentative diagnoses of exophthalmic goiter were made in three other girls. It was recommended to the board of health of Cincinnati that the ingestion of a definite and constant supply of iodin by each person be insured, administered through the medium of table salt; also that the board of health favor the enactment of a federal statute requiring the iodization of all table salt in the United States, to insure uniformity of the product and restore to common salt an ingredient, which when naturally present, is invariably removed in refining. The proportion of one part of an iodin compound, such as sodium iodid to 5,000 parts of salt apparently satisfies the requirements. The proposition was submitted to the Cincinnati Academy of Medicine with the request that, after assuring itself of the merits of iodized salt, it recommend the use of this product.

PENNSYLVANIA

The Oldest School of Medicine.—The one hundred and fifty-ninth annual session of the University of Pennsylvania School of Medicine, Philadelphia, opens September 26. This, the oldest medical school in the United States, was founded by Dr. John Morgan, who held the first medical professorship created in the colonies. The total number of graduates from the University of Pennsylvania School of Medicine has been 14,911.

Hospital News.—The cost of food at the Hamot Hospital, Erie, in 1923, according to the annual report, was at the rate of 52 cents a day for each person. The average number of patients treated daily was 134, and the daily average of the entire hospital family, 270. Based on the unit cost of a patient a day, the food cost $1.33. The total cost of caring for a patient a day was $4.22, or 40 cents more than the average for the previous year.——The tuberculosis hospital board of Erie County has selected Wolfi farm, near Erie, as a site for the new tuberculosis hospital. The site has been approved by the state department of health.

History of a Mental Clinic.—In June, 1921, Dr. James Allen Jackson, superintendent of the Danville State Hospital, and Dr. Horace V. Pike, director of clinical psychiatry, read papers on the importance of early recognition of mental disorders before the Lycoming County Medical Society. After the meeting the secretary of the Williamsport Social Service Bureau requested that a number of persons in whom the bureau was interested, be examined and Dr. Pike came to Williamsport for two days to conduct the examinations. In return for that assistance, it is reported, the secretary offered the state hospital, the use of her city hall office for interviewing patients on furlough and within six months the work increased so the secretary could not do it justice in connection with the social service bureau. A conference was arranged with prominent members of the community. A committee secured permanent quarters for a mental clinic at the Lycoming County Health Center, and funds for a full-time psychiatric nurse were guaranteed. This enlarged the field of the clinic. Cases were referred by physicians, clergymen, courts, the police, the social service bureau, the Lycoming County Children's Aid Society, Home for the Friendless, Girls' Training School, Boys' Training School, State Industrial Home at Muncy, and by parents. The clinic is entering now its fourth year in this community with 400 new patients registered. The average number of patients at the semi-monthly sessions of the clinic in the last year has been from twenty to twenty-five. There has been added a field representative of the bureau of mental health of the state department of public welfare and a class for retarded school children established. The growth of the Williamsport Mental Health Clinic has at least been coincident with the decrease of more than 6 per cent. in the last three years in the admission rate to the Danville State Hospital. Until three years ago, there had never been a year since 1869 when the hospital was founded, for which the number of patients did not exceed the number for the previous year.

Philadelphia

Hospital News.—The Memorial Hospital, 5614 Walnut Street, erected in memory of William E. Fehrenbach, was dedicated, September 5.

Tuberculosis Society Moves.—The Pennsylvania Tuberculosis Society has moved its headquarters from 10 South Eighteenth Street to the new Social Service Building on Juniper Street below Spruce, which building now houses most of the health and welfare organizations of Philadelphia.

Smallpox Quarantine.—A case of smallpox in South Philadelphia caused the police to establish a quarantine at midnight from Tenth to Twelfth streets and from Christian to Carpenter streets, affecting more than 2,500 persons. The patient was a negro who came here two weeks ago from Raleigh, N. C.

RHODE ISLAND

Society News.—The quarterly meeting of the Rhode Island Medical Society held at Newport News, September 4, under the presidency of Dr. William F. Barry, was, in part, an outing with the Newport County Medical Society as host. A tour was conducted, including the Newport Hospital, the Naval Hospital, the Naval Training Station and Fort Adams, ending at the beach where dinner was served. The mayor of Newport gave an address.

TEXAS

Approved Tourist Camps.—The state board of health has placed its approval on fifty tourist camps in the state, according to the state health officer. To be in this class, the camp must have a safe water supply, a system of sewerage that eliminates danger of contamination of the soil and disease transmission, a method of refuse collection that insures sanitation and a caretaker who enforces sanitary regulations. Following is a list of the approved camps to date:

Waco, Mineral Wells, Barstow, Belton, Plainview, Houston, Stephenville, Amarillo, Fort Worth, Shamrock, Gainesville, Austin (Deep Eddy), Glenrose (City), Donna, Glenrose (Wright), Wharton, McKinney, Laredo, San Antonio, San Antonio (San Pedro), Lubbock, El Paso (Camp Grande), Brownsville, Waco (Cotton Palace), West, Marlin, La Grange, Marble Falls, Calvert, Lufkin, Greenville, Henrietta, Texarkana, Midland, Houston (Central), Vernon, Dalhart, Beaumont, Brady, Glenrose (Automobile), Dalhart (City), Texline, San Jacinto (State), San Antonio (Brackenridge), San Antonio (Roosevelt), Palo Pinto, Fanning State), Austin (Barton Springs), Glenrose (Glenwood).

WEST VIRGINIA

Personal.—Dr. Benjamin L. Hume, Huntington, has been appointed coroner for Cabell County to succeed Dr. Earl B. Gerlach.

WISCONSIN

Resolutions Adopted by the State Society.—At the seventy-eighth annual meeting of the State Medical Society of Wisconsin, Green Bay, August 20-22, the house of delegates adopted a resolution that there be created a section on radiology. The Milwaukee County Radiological Society was empowered to organize the section. Three resolutions adopted at the last meeting of the American Medical Association in Chicago, which concern (1) the modification of the National Prohibition Act where that act violates the confidential relation that must be maintained between physician and patient, (2) what is ethical and what is unethical in institutional publicity, and (3) the labeling of cosmetics and dyes containing poisonous drugs, were also adopted. The committee on resolutions also recommended for adoption: (1) That the committee on health and public instruction and that on school hygiene be combined as the committee on health and public instruction; (2) the appropriation of $575 to the committee on cancer to carry out the work outlined in its report; (3) the appropriation of $500 to the committee on health and public instruction to carry out its 1925 program; (4) that the future policy of the society shall be to expend its resources solely in promotion of its own activities. All of these resolutions were adopted.

GENERAL

Memorial to Morton.—A monument in memory of Dr William Thomas Green Morton, who administered ether for a surgical operation at the Massachusetts General Hospital, Boston, Oct. 16, 1846, was dedicated, September 1, at Charlton, Mass., his birthplace.

Tuberculosis in General Hospitals.—The following resolution was adopted at the recent annual meeting of the National Tuberculosis Association at Atlanta:

Resolved, That the National Tuberculosis Association reaffirms its belief in the need of admitting cases of pulmonary tuberculosis to general hospitals in order to permit of a more intensive training of the young medical men of the country in this important field.

Society News.—The council of the National Academy of Sciences has accepted the invitation of Harvard University and the American Academy of Arts and Sciences to hold its annual meeting in Cambridge and Boston, November 10-12. The arrangements for the meeting will be made by the local committee, the secretary of which is Edwin B. Wilson, Ph.D., of the Harvard School of Public Health, Boston.

Communicable Disease.—The *U. S. Public Health Reports* state that 760 cases of typhoid fever from thirty-three states were reported for the week ending August 9, and 831 cases for the corresponding week of 1923. There were reported 316 cases of smallpox for the week and for the corresponding week last year, 145 cases. Eight hundred and forty-four cases of scarlet fever were reported this year as against 638 cases for the week ended August 9, last year. There were 1,019 cases and 1,066 cases of diphtheria, respectively, for the weeks ending August 9 of 1923 and 1924.

Foreign Medicines in China.—The Bureau of Foreign and Domestic Commerce of the U. S. Department of Commerce states that the Chinese Maritime Customs returns show that drugs and medicines imported into Canton amounted to $507,736 in 1922, and in 1923, $615,288. The bulk of foreign medicines and drugs used in this district come from England, nearly all being shipped from stocks carried in Hongkong and Shanghai. The prices quoted by British exporters are said to be lower than those at which American goods are available.

Personal.—The United States delegation to the Fourth Pan-American Congress on Child Welfare, to be held at Santiago, Chile, October 12-19, includes, among others, Dr. Ella Oppenheimer of the Children's Bureau of the Department of Labor; Dr. Carlisle P. Knight of the U. S. Public Health Service; Samuel McCune Lindsay, Ph.D., professor of political science at Columbia University; Edwin N. Clopper, Ph.D., assistant secretary of the Cincinnati Council of Social Agents, and Dr. Webster E. Browning, secretary of the committee on cooperation in Latin America.

Campaign to Enlarge American Hospital in Paris.—Hon. Myron T. Herrick, U. S. ambassador to France, is head of a committee to obtain funds to complete the memorial building adjoining the American Hospital of Paris. The present hospital of thirty-two beds is inadequate for Americans living abroad, together with tourists and others who go on business. It is planned to increase the capacity to 120 beds, and to complete and equip the buildings $1,097,000 will be required. About half of this sum has been subscribed. The American Hospital is in Neuilly-sur-Seine and includes an area of about 1,500 square meters.

Food Conservation Conference.—The first Pan-Pacific Food Conservation Conference was held in Honolulu, July 31-August 14. Of the ninety-five delegates present, thirty-eight were from the United States, fifty-five from other Pacific countries, and two from the West Indies. Fourteen Pacific countries were represented. The conference, held under the auspices of the Pan-Pacific Union, was organized in seven sections. At the final sessions thirty-three resolutions were adopted, three of which referred to the work of the Pan-Pacific Science Congress, which will be held in Japan in the autumn of 1926.

Dedication of Bust of Pasteur.—The American Institute of Baking, Chicago, will dedicate a portrait bust in bronze of Pasteur at the institute, 1135 Fullerton Avenue, September 16 (THE JOURNAL, June 14, p. 1978). The bust was presented by Helge Jacobsen, director of Carlsberg Glyptotek; Vagn Jacobsen, director of Carlsberg Brewery; and the Carlsberg Fund, Poul C. Poulsen, director, Copenhagen, Denmark. The French consul at Chicago, Mr. A. Barthelemy, and Dr. S. P. L. Sorensen, director of the Carlsberg Laboratories, Copenhagen, Denmark, will speak, and the presentation will be made on behalf of the donors by Dr. Max Henius, president of the Wahl-Henius Institute.

The International Union Against Tuberculosis.—Founded in 1920, this organization has published the first number of its bulletin. Twenty-four countries are now affiliated with the union, whose affairs are directed by an executive committee and a council that meets once a year. The first conference was held in Paris in 1920; the second in London, 1921; the third in Brussels, 1922; the fourth at Lausanne, Aug. 5-7, 1924. The union, formed primarily among nations signatory to the covenant of the League of Nations, includes the United States. Its objects are to coordinate the efforts of all organizations engaged in a campaign against tuberculosis and to collect and distribute information on questions concerning this disease. The bulletin will publish papers read at the conferences. It will be issued quarterly in the French and English languages on facing pages.

Scientific American Reports on Abrams Investigation.—The committee appointed by the *Scientific American* about a year ago to investigate the so-called electronic reactions of Abrams has rendered a report. The conclusion was, in part, that "The entire Abrams electronic technic is not worthy of serious attention in any of its various forms. At best, it is all an illusion; at worst, it is a colossal fraud. The so-called electronic reactions of Abrams do not exist—at least objectively. They are merely products of the Abrams' practitioners' minds." The committee which conducted the investigation

comprised Dr. William H. Park, director of the bureau of laboratories of the New York Health Department; Dr. Walter C. Alvarez, associate professor of research medicine at the George Williams Hooper Foundation of Medical Research, University of California; Robert C. Post, a civil engineer, and J. Malcolm Bird and Austin C. Lescarboura, editors of the *Scientific American*.

The Pan-Pacific Research Institute.—The Castle home with 4 acres of land, one of the largest in Honolulu, and another building almost as large, is to be the home of the Pan-Pacific Scientific Research Institute. According to *Science*, the buildings will house, besides the permanent staff, about forty visiting research scientists. This gift will be the nucleus of the Pan-Pacific University, a graduate institution for which a charter was granted some years ago. The chief work of the research institute will be along lines of study of food resources of lands in and about the Pacific Ocean. It will not be connected with any other institution but will cooperate with kindred institutions. Scientists who, for months, have been planning the Pan-Pacific Research Institute will report at the coming conference and it is understood the institute will begin operations at once. Dr. David Starr Jordan, chancellor emeritus of Stanford University, it is reported, has tentatively accepted the directorship of the institute.

Bequests and Donations.—The following bequests and donations have been announced recently:

To the Shriners' Hospital for Crippled Children, St. Louis, the estate of Col. Clarence A. Sinclair, the value of which is estimated at more than $100,000, for the erection and maintenance of a home for convalescent children.

Methodist Episcopal Hospital, Brooklyn, $100,000, from an anonymous donor.

The Wisconsin Deaconess Hospital, Green Bay, $50,000, by Dr. Julius J. Bellin of Green Bay.

The will of Frank P. Woodside provides $50,000 of Baltimore city 4 per cent. stock for the Church Home and Infirmary, Baltimore, as a memorial to his parents and to be used to provide a room for free patients.

The City Hospital, Hamburg, Iowa, $40,000, and the Hand Hospital, Shenandoah, Iowa, $5,000, by the will of Mrs. Mary Shoults.

The Staten Island Hospital, $25,000, by the will of the late Wm. G. Willcox.

To the Sharon Sanatorium, Boston, an anonymous gift of $25,000 recently.

The will of the late Elkan Naumburg, among other public bequests, contained gifts of $1,000 each to the Hospital for Ruptured and Crippled, the Beth Israel Hospital, the Sydenham Hospital, and the Hospital for Joint Diseases.

H. H. Cushman has given a fund carrying $750 each term for the establishment of a graduate fellowship in chemical research at Western Reserve University, Cleveland.

Final Report of Framingham Demonstration.—The National Tuberculosis Association has just issued a final report on the seven year tuberculosis and health study in Framingham, Mass. There was a decrease in the tuberculosis death rate in Framingham, as a result of the seven years' work, of 68 per cent., while the reduction was only 32 per cent. in neigboring towns just outside the demonstration area. The death rate among infants under 1 year of age was reduced 40 per cent. The conclusion was reached from this study that one person in every hundred has active tuberculosis and another 1 per cent. has tuberculosis in an arrested or latent form. That the Framingham demonstration was not an "experiment" on the city is shown by the fact that almost the entire health program is supported today by public and private funds at a per capita cost of $2.40. This demonstration was conducted with funds from the Metropolitan Life Insurance Company, but almost any community in the United States can afford to pay the price for a similar or greater reduction of deaths from tuberculosis. As a result of interest which this demonstration aroused, the Milbank Memorial Fund has started a tuberculosis and public health study in Cattaraugus County and Syracuse, N. Y., and a third in a district having 200,000 people in New York City. The Milbank Memorial Fund expects that these three demonstrations will receive such public attention as will make possible a rapid adoption in this and other countries of sound public health methods. In addition to the New York demonstrations, others are being conducted in Mansfield, Ohio, Fargo, N. D., Rutherford County, Tennessee, Athens, Ga., and elsewhere by the American Child Health Association, Commonwealth Fund and other agencies.

Regional Cancer Campaign.—The object of the recent campaign of the American Society for the Control of Cancer was to create interest in cancer control so that persons who had cancer in its early stages might suspect their condition and apply to reliable physicians for treatment. With this end in view, early symptoms were described and people informed that their hope of cure lay in immediate and skilful treatment. This was the society's "message." The whole country was organized into committees and subcommittees. Each state has a permanent chairman and under him are many chairmen, in some states one for each county and for each of the larger communities. The American Society for the Control of Cancer supplied most of the educational material used in the campaign. Many state chairmen had copies of the film, "The Reward of Courage" and other lantern slides, which were shipped from place to place. Circulars and posters for general display purposes, handbooks for physicians, booklets for intelligent readers, lecture outlines for physicians, a formal letter to be read before church congregations and exhibits for medical meetings and health shows, were used to deliver the message. Two of the circulars, for example, were printed to the extent of 2,700,000 copies each. As an example of how the regional campaign was conducted by local agencies, a note is quoted concerning the District of Columbia:

"The work in Washington, under the direction of Dr. H. H. Kerr, was promoted by a committee of one hundred. The members were leading citizens, members of congress and federal departments, representing all phases of activity. Newspaper clippings show that there was a large amount of interest and activity. An excellent double-column editorial, fifteen inches long, appeared in the Washington *Post*, April 13. The manager of the National Theater allowed his theater to be opened every day for noontime meetings which were addressed by prominent physicians and laymen. The Society's cancer film was shown daily at these meetings. Radio talks were a part of the week's program and resulted in advertising clinic facilities, at which 300 patients were examined. Most of these patients applied at the clinic for women which has been conducted by the Women's Welfare Association since cancer week of 1922."

LATIN AMERICA

Hospital News.—The new Santo Tomas Hospital erected by the Republic of Panama in Panama will be formally dedicated, September 19. The presentation of the complete hospital will be made by Major Edgar A. Bocock, M. C., U. S. Army, who has been superintendent and chairman of the building committee. The hospital will be accepted by Col. Juan Antonio Jimenez, secretary of public works, and then will be officially opened by Dr. Belisario Powas, president of the Republic of Panama.

Vital Statistics in Ecuador.—The *Anales* of the Sociedad Médico-Quirúrgica of Guayaquil quotes the official record of the mortality in Ecuador in 1921, the first year that such statistics have been compiled. With a population of 2,000,000, the death rate was 24.55 per thousand inhabitants. Infant mortality forms 34 per cent. of the total, but only 22.6 per cent. in the three larger cities. The deaths after 60 form 10 per cent. Whooping cough leads the list in child mortality with 4,776 deaths; measles, 1,144. The child mortality forms 60 per cent. of the total. Pneumonia heads the list in adults, and tuberculosis comes sixth, smallpox and cancer tenth and eleventh. There were only seven deaths from diphtheria and croup and ten from leprosy.

Typhoid Epidemic in Cuba.—There remained under treatment, August 10, 250 cases of typhoid feyer in Havana. Typhoid fever during June increased from 4 cases with 1 death in the first ten days to 173 cases with 18 deaths in the last ten days. This was the beginning of the epidemic; from July 1-10 there were 204 cases with 38 deaths; July 11-20, 100 cases with 20 deaths; July 21-31, 89 cases with 17 deaths, and from August 1-10, 76 cases with 17 deaths. These include cases brought to the city from the interior of the country for treatment. The epidemic has been attributed to the water, of which the city requires about 80,000,000 gallons per day. Little more than half of this amount is supplied from the Vento Springs, the remainder from the Almendares River, which is subject to pollution, especially during the rainy season. This river has now been cut off to prevent infection, leaving the city with only half the necessary amount of water, and defective conditions in the city water mains, with surface seepage, have been reported. Vaccination against typhoid has been made compulsory under penalty of fine and house to house visits are being made by the sanitary department for the purpose of vaccination, about 6,500 inoculations being made each day.

FOREIGN

School of Tropical Medicine.—The London School of Tropical Medicine became incorporated in the London School of Hygiene and Tropical Medicine, August 1. Dr. Andrew Balfour is director of the new school. All members of the staff of the former institution have signified their desire to become members of the staff of the new school.

Warning Against Possible Fraud.—The *Deutsche medizinische Wochenschrift* recently published an advertisement

asking for a German physician to serve in an American private hospital, giving no address beyond the ad number. Our exchange now warns its readers to be wary of sending the originals of their credentials in applying for such a place and warns against moving to America on the mere statements of the alleged private hospital without making inquiries.

Organization of Medical Women in Germany.—This organization is now issuing a quarterly, the first number of which has appeared. Dr. Heusler-Edenhuizen and Dr. Laura Turnau are the editors. The Bund deutscher Aerztinnen is affiliated with the Medical Women's International Association, and was well represented at the recent conference at London. The *Nederlandsch Tijdschrift voor Geneeskunde* remarks that it had supposed that the days were past for such "zoological discrimination" between medical men and medical women, that the latter must have a periodical of their own.

Netherlands Council on Pharmacy and Chemistry.—The seventh report issued by the Rijks-Instituut voor Pharmaco-Therapeutisch Onderzoek has ten sections. One is devoted to nostrums, one to proprietaries, another to trials of newly marketed drugs. A simplified technic for making insulin is described by Sjollema and Seekles of the Veterinary College at Utrecht. It uses for 10 kg. of beef pancreas only 27 liters of absolute alcohol, the separation of the insulin being aided by ammonium sulphate. The yield from 100 kg. of beef pancreas is 37.34 gm. of insulin, corresponding to 140,000 units. The insulin was tested by the council in three university clinics, answering all expectations.

Typhoid Fever in London.—There were forty-two deaths from typhoid fever in London in 1923, and forty-five in 1922. The autumnal prevalence of this disease, formerly so usual, has not been observed in England since 1912. London has had two kinds of epidemic disease commonly diagnosed as typhoid. One of these, due to eating polluted fish and associated with dysentery, may occur in explosive outbreaks but has no tendency to spread from case to case. It increases in the autumn, attacks males from 10 to 25 years of age preferentially, and is mainly limited to the working classes. The other kind of epidemic disease commonly diagnosed as typhoid is met in psychopathic hospitals. It does not occur in explosive outbreaks, has no marked autumnal increase, appears to spread from case to case; attacks females preferentially and has no special incidence in a particular social class. The first type of epidemic disease commonly diagnosed as typhoid has almost completely disappeared in recent years.

Immunization of Infants Against Tuberculosis.—Since Calmette's publication on the BCG bacillus and his success with it in immunizing the young (summarized in THE JOURNAL, July 12, 1924, p. 155, and August 9, p. 477), he has been besieged with requests to immunize infants. He now reiterates that it would be premature to introduce the method into current practice before time has confirmed its value and harmlessness. "We must wait two or three years to compare the outcome in the vaccinated and nonvaccinated children." As the culture is a living bacillus, it has to be freshly prepared, and cannot be kept for more than ten days. But the Paris Pasteur Institute, 25 rue Dutot, is supplying it free of charge to physicians, on request, who guarantee to apply the vaccine according to directions, that is, exclusively during the first ten days after birth, giving it in a teaspoon with a little tepid milk half an hour before feeding, every second day, to a total of three doses. At present the use of the vaccine is restricted to families in which there is an open source for contagion. He adds that the ordinary tuberculin tests lose all dependability after the vaccination.

Deaths in Other Countries

Dr. **Andrew Smith,** formerly president of the North of England Branch, British Medical Association, August 1.—**Reginald C. Cottell,** Col., R. A. M. C., retired, commanding officer, King George's Hospital, during the World War, August 7.—Dr. **R. Koralewski,** honorary president of the Medical Verband of Lower Austria.—Dr. **Albert Narath,** professor emeritus of surgery at Heidelberg. He was professor of surgery at Utrecht until 1906, when he succeeded Czerny in the chair at Heidelberg. His great work "Surgery of the Stomach" is now in press.—Dr. **Ernesto Fernández Espiro,** Montevideo, president of the public health service of Uruguay and founder of its official bulletin. He presided at the Sixth International Sanitary Conference, which convened at Montevideo two years ago.—Dr. **E. Seton Pattison,** senior surgeon of the Atlantic Transport Line, known to thousands of American travelers; September 3; aged 69.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Aug. 18, 1924.

Medical Women's International Association

The third meeting of the Medical Women's International Association has been held in London. The retiring president was Dr. Lovejoy of New York, and the new president Lady Barrett, M.D. Delegates from fifteen out of nineteen possible countries were present: Great Britain, 7; Australia, 5; United States, 28; South America, 1; Germany, 6; Turkey, 1; India, 12; Norway, 3; France, 3; Switzerland, 2; Czechoslovakia, 1; Austria, 1; New Zealand, 5; Poland, 4; Russia, 2. The foreign delegates were guests of the Medical Women's Federation, a large number of whom attended. Hospitality was arranged for the foreign guests.

MATERNAL MORBIDITY AND MORTALITY

Lady Barrett opened a discussion on maternal morbidity and mortality. She said that the general health of women was far below the standard that could protect them from toxemias. One of the great problems was the health and conditions of life of child-bearing women. In Great Britain there were certain groups concerned in watching the women's health and in improving it, and also groups concerned with the education of physicians and midwives. The midwife was the important factor. She had more leisure than the physician for observing the patient's symptoms. In this respect, she could be an important factor in the prevention of illness or death. The number of maternity clinics, with antenatal and postnatal care as their object, was continually increasing. More and more beds were being provided for women who needed them, and also small homes linked up with large hospitals.

Dame Janet Campbell, senior medical officer of health for maternity and child welfare, in the ministry of health, outlined the work of the public health service in relation to maternal morbidity. There had been almost no reduction in maternal mortality during the last thirty years. Three thousand women died last year, or one for every 250 births. In 1902, the Midwives Act had given better midwives, and puerperal sepsis had come down a little, but still accounted for two fifths of the maternal deaths. Every case of puerperal fever had to be reported by the physician to the health officer in order that the patient might receive all necessary treatment, and that infection might be prevented. But, in practice, only a small proportion of the cases were reported, and these chiefly when the patient was very ill or dead. It was hoped to improve notification and so make the chances of success better. The local authority had wide powers to improve treatment, and was ready to help the physician or woman who asked for assistance. Antenatal supervision was provided in maternity centers, many of which were staffed by women who were expected to have a special knowledge of midwifery. There were splendid staffs of nurses, and the maternity center provided examination, advice and instruction, and treated minor ailments. Complications were referred to special hospitals. Venereal disease was treated in some centers. Postnatal treatment also was given.

Dr. Balfour (India) said that the circumstances in India were discouraging. Medical men and women were excluded from the normal lying-in room. There were no professional midwives, and the middle-aged native nurses knew nothing and were in the habit of interfering unnecessarily. Medical women were called only to serious complications, and often the mother died or the child was lost. A public health

department now devoted attention to childbirth, but was heavily handicapped. In Bengal, 84 per cent. of mothers were under 30, and the mortality of these was 14.8 per thousand. In 1921, 60,000 women died in childbirth, and 1,000 of tetanus.

Dr. Davis (United States) said that the whole subject was bound up with prenatal conditions. The naturally delicate or somewhat degenerate might live badly, and healthy women might do the same. Some American women ate too much and had oversized children. As regarded the nursing technic, something must be wrong when so many cases were lost through infection. A simpler technic might be safer. Every nurse should be taught about gonorrhea in this connection. In the majority of cases, the patient could be made safe, but there was more trouble with toxemia than with infection. In America, eclampsia was often caused by too little exercise and too much food. In infection it was important to use oakum instead of vulvar pads, and to drain the uterus by raising the head of the bed. Incomplete drainage resulted in chronic gynecologic infection. The teaching of midwives was a great problem in the United States. The midwife was ignored, but she prevailed.

Paraffin and Cancer

At the annual general meeting of the Imperial Cancer Research Fund, Dr. Sidney Martin, chairman of the executive committee, in moving the adoption of the twenty-second annual report, said that the executive committee authorized the inclusion in the eighth scientific report of the monograph of Dr. Scott on the paraffin dermatoses and paraffin cancer because of its unique features, which were the long-continued careful observation on workmen exposed continually to a peculiar form of chemical irritation known to induce cancer. The acute and chronic skin lesions in workers in crude paraffin were described and the relation of these lesions to the subsequent development of cancer was discussed on the evidence of the individual histories of the workmen, and the whole body of facts surveyed. Dr. Martin drew attention to the absence of any close relation between the intensity of the acute early lesions and the later development of cancer, so that in some individuals only extremely slight indications of skin irritation preceded its development. Another point was the long number of years (never less than fifteen or twenty) after which the disease began. The proportion of the workers in whom cancer developed was found to be less than 2 per cent. per annum of those engaged, and Dr. Scott has shown that it is mainly in the men engaged in certain stages of the preparation of liquid petrolatum from shale that these cases occurred. On the basis of his findings, a very complete preventive regimen had been instituted by the Scottish Oils Company. This had already reduced the incidence of the acute irritative disturbances in the operatives, but its effect on the occurrence of cancer can be seen only after a longer time. Dr. Leitch, director of the research department of the Cancer Hospital, allowed the publication in Dr. Scott's paper of a summary of his results in testing the crude and refined oils for their "carcinogenic" powers on animals. These results confirmed the importance of the unrefined oils incriminated by Dr. Scott, and showed the innocuousness of the refined product. This fact should reassure those using refined paraffin medicinally who may have become alarmed by these reports of the production of paraffin cancer. Reference was then made to papers mentioned in the report. That of Dr. Murray, the director, dealt with the meaning of the long period—from ten to twenty years in man, and from five to twelve months in mice—during which cancer-producing agents must act before the disease sets in, and the paradoxical result that, once an animal has become cancerous there is an apparent incapability to induce a fresh growth by applications of tar to another part of the body. These observations illuminated the rarity of multiple primary cancer. Dr. Cramer's vitamin work dealt with an aspect of cancer growth that had led to a great deal of loose speculation. He showed that, when put to the test of direct experiment, no degree of vitamin deficiency compatible with life had any effect on cancer growth.

Low Birth and Marriage Rates

The return issued by the registrar-general gives statistics of births and deaths for the quarter ended June 30, 1924; and of marriages registered in the quarter ended March 31. The births registered in the second quarter of 1924 numbered 187,157, being 1,671 more than in the preceding quarter, but 9,674 fewer than in the corresponding quarter of 1923. They correspond to an annual rate of 19.5 per thousand of the estimated population. This is the lowest birth rate recorded in any second quarter except during the period of the war. The deaths numbered 114,176, and were 46,103 fewer than in the preceding quarter, but 136 more than in the corresponding quarter of 1923. They corresponded to an annual rate of 11.9 per thousand of the estimated population. Influenza was either a primary or contributory cause of death in 4,178 cases, or 3.7 per cent. of the total. Infant mortality was equal to 69 per thousand, being 13 per thousand below the average of the ten preceding second quarters. Seven fatal cases of smallpox were registered during the quarter. The number of persons married in the first quarter of 1924 in England and Wales was 93,990, a decrease of 59,422 from the number in the preceeding quarter, and 12,572 below that in the corresponding quarter of 1923. The number corresponds to an annual rate of 9.8 per thousand of the estimated population, and is the lowest rate recorded in any quarter since the establishment of civil registration.

PARIS

(From Our Regular Correspondent)

Aug. 15, 1924.

The Decrease of Chlorosis

Recent years have brought a considerable decrease in the incidence of chlorosis, not only in France but also in Switzerland, England, America and other countries (THE JOURNAL, Sept. 22, 1923, p. 1033; Jan. 19, 1924, p. 210, and Aug. 9, 1924, p. 456). The causes of this phenomenon were recently discussed before the Société médicale des hôpitaux of Lyons. Dr. Cordier does not think that better nutrition is the cause. The great privations of the war, in our invaded provinces and in the central empires, did not produce chlorosis. Also Dr. Garin and Dr. Mouriquand confirm that inanition does not suffice to occasion chlorosis. Garin stated that he had not observed chlorosis among the starved populations of the Balkans, during the campaign in the East. Dr. Leclerc, who, in 1885, wrote his doctor's thesis on febrile chlorosis, recalled that, at that time, his observations concerned, in the main, young girls employed in silk manufacture, who were overworked, poorly nourished and badly housed. Today, conditions are entirely changed. In the first place, the class of workers just referred to has been reduced by more than one half, for which various causes have been operative. The food has been improved. Formerly, chlorotic patients were frequently found also among young women from the rural districts who came to the city to work as domestics. From that side, too, an improvement has been noted, as is shown by the present scarcity of domestics. As for the young women of the well-to-do class, they live now less secluded lives and are not coddled to the same extent that the previous generation was. They spend more time in the open air, with resultant benefit to their health. Cordier does not accept this as a satisfactory explanation. For the mere fact that some young women have broken away from the close supervision of their parents and are more devoted to tennis than their

mothers were; because a few working girls are a little better washed and breathe a little better air than operatives forty years ago, should that entitle us to be satisfied with the progress of hygiene and justify us in closing our eyes to the fact that the squalid tenement still persists, that the hasty lunch at the bake-shop or the sausage dealer's is still in vogue, and that many a seamstress or needle-woman is still suffering from overwork?

Cordier raises the question whether there was not, toward the end of the nineteenth century, a kind of pandemic attended with anemia, affecting mainly women worn out from overwork and the weakening influences of an abnormal sexual life. Leclerc opposed Cordier's hypothesis, and declared that chlorosis was an affection probably as old as creation. It is described by ancient authors. It is impossible to assume that the disease is of a transitory character occurring at certain periods. It is encountered less and less, in the hospitals especially, but it is still found among urban clients. Also Professor Bard rejects the theory of a pandemic that might have been transitory like all great epidemics. The fact that the disease is confined to one sex and affects that sex at a definite physiologic period does not harmonize with what we know of the laws governing the receptivity of epidemic diseases. The striking feature in the etiology of chlorosis is the very evident connection with the onset of puberty in woman. We must seek, therefore, the causes for its decrease in factors that have a bearing on this particular feature of the disease. Progress in hygiene has resulted in an improvement in living and working conditions as affecting young women of the working class. They have profited especially by the law that raises the age limit which women must reach before they can be employed at manual labor in factories or in domestic service.

The Belgian Apartments in the University City

The *Journal officiel* has just published a governmental decree authorizing the University of Paris to accept the donation of Monsieur J. H. Biermans and Madame Berthe Lapôtre, amounting to five million francs, which will bear the name "Fondation Biermans-Lapôtre en faveur des étudiants belges en France." The endowment will be used for the construction of apartments suitable for the housing of at least 200 students from Belgium, Luxemburg and Limburg, Holland, who are studying, or may desire to study, in Paris. The apartments, which will be built after the Flemish style of architecture and also furnished in Flemish style, will be erected on the grounds of the University City, to which reference has been made in previous letters. Together with the Canadian Apartments, due to the initiative of Senator Wilson and M. Philippe Roy, commissioner general for Canada in France, it will be among the first apartments for foreigners to be established in the University City.

An International Institute of Intellectual Cooperation

M. François Albert, minister of public instruction, has addressed a letter to Prof. Henri Bergson, president of the International Commission of Intellectual Cooperation of the League of Nations, assembled at Geneva, asking him to inform the commission that the French government was willing to establish at Paris an international institute of intellectual cooperation. The plan for the institute will be drawn up by Professor Bergson, and this plan, together with the proposal of the French government, will be submitted to the council of the League of Nations.

Death of Dr. Gustave Richelot

Dr. Gustave Richelot, agrégé professor at the Faculté de médecine of Paris and former surgeon to the hospitals, has died, at the age of 80, at Bernerie (department of the Loire-Inférieure), to which place he retired a few years ago. Richelot was born in 1844 at Paris, where he carried on his medical studies. He was appointed agrégé professor in 1878, and became surgeon to the hospitals in 1880. He devoted himself more particularly to gynecology. He was a member and a former president of the Academy of Medicine.

Death of Prof. Jean Escat

The death of Dr. Jean Escat, professor of clinical urology, in Marseilles, as the result of a finger prick inflicted during an operation, has been announced. He was a member of the Société française d'urologie and the Association internationale d'urologie. He had been formerly president of the Congrès français d'urologie.

BELGIUM

(From Our Regular Correspondent)

Aug. 20, 1924.

The Congress of Neurology

The twenty-eighth Congress of French-Speaking Medical Alienists and Neurologists, under the presidency of Drs. Massary (Paris) and Glorieux (Brussels), has just been held at Brussels.

ABNORMAL CHILDREN AND MENTAL DEBILITY

Drs. Simon and Vermeylen presented a study of children with mental debility. Simon has carried out researches on the children in the colony of Vaucluse. He reached these conclusions: Retarded children with the mentality of 2-year-olds make little progress. For children of from 5 to 12 years mentally, the chances of progress increase regularly in proportion as their mental level is higher. The authors are making a special study of epilepsy, insanity (rare in children), and delinquency as complications of mental debility. Of 1,236 children sent to the Moll school of observation by court judges, Vermeylen found 315, or 25 per cent., who were mentally deficient. As might be expected, the age of puberty brings a very evident increase in delinquency. In this connection, Dr. Vermeylen discussed in a separate communication the functioning of the section for abnormal children in the Gheel colony. During a period of two and a half years, 274 children have been admitted to the colony. At present, the section comprises 178 children. Seventy per cent. of these children are susceptible of education. A school of three classes has been organized. Special courses are given in the evening for the older children. The personnel comprises a physician, a woman nurse and three women instructors. The assignment to classes is made after an examination by mental tests (the psychographic method of Vermeylen).

THE CONTAGIOUSNESS OF TARDY EPIDEMIC ENCEPHALITIS

Dr. Guillain reported his observation of a case of contagious tardy epidemic encephalitis (parkinsonism) which developed owing to sialorrhea. A man, aged 22, affected with infantile paralysis, who was allowed to sleep between two patients with postencephalitic parkinsonism, contracted recently typical epidemic (lethargic) encephalitis. There seemed to be no doubt that the infection was derived from an adjoining patient. Consequently, it is indispensable to isolate patients with postencephalitic parkinsonism. Their lesions are not cicatricial but rather in an evolutional state. In families, it should be made known that these patients may be dangerous, especially if they kiss children.

PSYCHIATRIC SERVICES IN PRISONS

Dr. Vervaeck discussed the activities of psychiatric services in prisons. Their purpose is to assure scientific observation of detained persons affected with nervous attacks or psychic disorders, or suspected of malingering. During the last three years and a half, 608 detained persons have been observed. There were 250 constitutional psychopaths and feebleminded persons (40 per cent.); 21 per cent. were

neurotics; only 17 per cent. were affected with mental alienation properly so called, and 5.4 per cent. were of sound mind.

MENTAL AFFECTIONS AND SYPHILIS

Dr. Hoven presented the results of his researches on the frequency of syphilis in mental affections. Out of a total of 757 patients with mental illness, 135 gave a positive blood Wassermann reaction, or 17 per cent. of the cases. After deducting the cases of general paralysis and pseudoparalysis, there were 95 positive cases, or 13 per cent.

Social Insurance

The lower house of parliament will soon have to deal with the proposed law on social insurance. If this bill is passed, it may bring about a profound modification in the medical profession, for, of 7,000,000 inhabitants, there would be almost 5,000,000 who would come under the application of this law. It is very evident that the liberty of the medical profession might be seriously curtailed if the proposed system should go into effect. The medical profession is plainly much aroused, and the medical journals are filled with articles ardently protesting against the innovation. The medical profession, says Dr. Dejace, has the right to ignore the measures adopted with a view to assure medical service to all; also the official fee schedules that will be established. Like other citizens, we can admire the efforts of the mutual societies and the public authorities made with the view of improving the general well-being, but let us preserve our liberty and not permit ourselves to be enslaved by any political party.

To ignore does not signify, by any means, to despise. We shall, in one sense, collaborate wholeheartedly in the enforcement of the law, and, if need be, with self-abnegation in cases in which we shall deem that charity is indicated. But, on the other hand, let us not allow any encroachments on our professional rights.

The dues, or fees, and the subsidies should inure to the advantage of those who will be compelled to accept health insurance and also to the benefit of the voluntary participants in the plan, with a view to assuring them medical care in sickness and indemnities for the loss of wages.

The question of the fees to be charged by the physicians will remain the same as it was before, and what it must, in all equity, continue to be. This question must remain absolutely free for each physician to decide as he thinks best, and the practitioner should in no sense be the object of any coercion. This thorny question, which in every country brings about clashes between the medical profession and the government authorities, is still far from being solved. Many lively engagements have been fought; but the war is still undecided, and no one can at present foretell what the exact solution will be.

To bring to a head this question, which is of such vital importance for the physicians of Belgium, a resolution was passed at the medical convention in Brussels (Journées médicales) requesting Dr. Glibert, inspector general of the medical service of the ministry of labor, to set forth the modifications to be anticipated in the present law pertaining to industrial accidents as well as the present projects of the legislators. The principles of the law pertaining to industrial accidents are not modified at all. The benefits of the law will merely be extended to all classes of workmen, including those engaged in agricultural and commercial enterprises, together with other employees. An indemnity of 50 per cent. of one's wages or salary payable in case of disability may, for more serious incapacity of long duration, be increased to 60 per cent., or to 80 per cent. in certain cases of total incapacity.

The free choice of physician does not obtain unless the employer has failed to organize his own medical service. However, the new legal provisions require more guarantees as to the value of the medical service furnished by the employer. Provision is likewise made for the adoption of a notification card to be given a workman when first employed, whereby he will be informed in regard to the character of medical service provided by his employer, if any.

As for the law pertaining to health insurance and premature disability, it will provide for the establishment of an insurance fund by the industrials, the insured and the state. The insurance will cover disability arising through sickness, including tuberculosis; maternal insurance, and accidents other than those provided for in the law pertaining to industrial accidents.

Assistance for Cripples

During the medical convention at Brussels (Journées médicales), Dr. Dam, director of the provincial institute for cripples, pointed out that the number of cripples in time of peace is at least as large as in time of war. So far our endeavors have been confined exclusively to war cripples; but we should not neglect the cripples of peace times, and we should not only view the problem from the humanitarian standpoint but should seek to rehabilitate such cripples and make them self-supporting members of society. Most cripples of peace times have been cripples since early childhood, and scarcely 60 per cent. of them attend school regularly.

In Denmark there is a well organized center which comprises: a clinical service of orthopedic surgery, a consultation service, a complete school, an industrial school for young men and young women, and, finally, a seaside sanatorium. In Belgium, we have no central organization as yet, though two provinces have organized such a service, Hainaut and Brabant. In the province of Hainaut, the institution at Charleroi deals solely with industrial education. For the province of Brabant, there is at Brussels a consultation center and a bureau of vocational guidance.

The time seems to have arrived for the creation of a national organization having the full support of the central government.

BERLIN

(From Our Regular Correspondent)

Aug. 9, 1924.

Adjustment of Health Insurance Controversy

Following is an abstract of the regulations affecting the general content of contracts between physicians and health insurance societies, drawn up by the federal committee entrusted with the adjustment of controversies between the two parties, May 12.

These regulations shall not be interpreted as abolishing the freedom of the *Krankenkassen* and the panel physicians to enter into contracts. They contain, rather, general principles for the adjustment of contract relations between the health insurance societies and the physicians, with a view to securing uniform and appropriate agreements.

RULES GOVERNING THE ADMISSION OF PHYSICIANS TO THE PANEL

Admission of physicians to the panel is accomplished through a special committee on admission, to which physicians may apply. Other things being equal, preference is to be given to resident physicians or those wounded in war. A larger number of native physicians than the regulations ordinarily provide for may be admitted, if, during the period immediately preceding the application for admission, they had served at least two years in that district or even in hospitals outside the district, and there are personal reasons for making exceptions. "Resident," as here used, includes physicians whose families (parents or foster parents) have lived, at the time of the application, for at least five years in the district, or who have lived in person a corresponding

time in the district. Physicians with a fixed salary, also physicians receiving a pension or who have been put on half pay, should not, as a rule, be admitted to panel practice. In the case of a single health insurance society or a league or union of several societies, there shall be a physician for every 1,350 insured; if medical care for the families of the insured is included, there shall be a physician for every thousand insured members. When physicians are permitted to give medical care to the members of several different health insurance societies, or leagues or unions thereof, they shall be counted as serving the individual societies on the basis of the proportionate relation that their membership bears to the total membership of the several societies thus served. If the number of insured that fall to each panel physician is, on an average, less than the authorized number but more than two thirds of that number, a "waiting period" of one year shall be established for that health insurance society or league. Health insurance societies have the right to employ supervising physicians, who are appointed with the approval of the competent representative council of physicians, without intervention on the part of the committee on admissions.

THE PANEL SYSTEM

As regards the panel system, the last system established by contract previous to Dec. 1, 1923, remains in force, if the physicians, on the basis of the transactions of the federal committee under date of Jan. 17, 1924, placed their services at the disposal of the health insurance societies and provided the *Krankenkassen* had not, before that date, introduced another panel system. A panel system cannot be held to be introduced unless, during its operation, the proper care of the members of the society and their families (if family care was included) was assured. If a controversy arises as to which panel system is the valid one, it falls to the arbitration bureau to give the final decision.

MODE OF COMPENSATION

Panel physicians may be remunerated according to a stipulated capitation fee (so much for each insured member monthly or yearly), or according to a case fee (so much for each case, whether extending over one day or a longer period up to some specified limit), or yet again, on the basis of single performances and an accepted schedule of fees. At the request of the *Krankenkasse*, every service performed by a physician must, unless otherwise specified, be noted on the patient's record card in the space designed therefor.

If payment is made by a capitation fee, the basis for adjusting the amount of the fee shall be in accordance with the relative morbidity in a given *Krankenkasse* (number of cases yearly to be treated, in proportion to the number of insured) and the average number of performances and the average amount of service that a physician is obliged to render in each individual case.

The stipulated capitation fee or case fee (whichever method of payment is in vogue) shall cover all the services rendered by the physician, but shall not include hospital treatment, special treatments or mileage fees.

In adjusting the fee for family treatment, the married members of a *Krankenkasse* or the heads of families shall pay a certain amount in excess of the amount paid by the unmarried members, which excess shall be determined in accordance with the average number of members in the families of the married members of the *Krankenkasse*.

LIMITATION OF PERIOD DURING WHICH MEDICAL CARE WILL BE GIVEN

If physicians are to be compensated according to the individual services rendered, an agreement must be reached locally as to the length of the period for which medical care will be given. The following statements and suggestions are to serve merely as examples as to how such limitations may be fixed:

1. Taking the records of all panel physicians and their treated patients, it has been found that, on an average, six and one-half times the consultation fee is sufficient to cover the total fee for a single case of illness. In any event, the total fee shall not exceed seven times the consultation fee.

2. The limitation may be arrived at also by considering the amount of service rendered by the individual panel physician and the number of cases in which he has given treatment, and by establishing the provision that, in all the cases of sickness of the individual panel physician, a certain average number of consultations and visits per case, to be agreed on locally, shall not ordinarily be exceeded in a given quarter.

If necessary, special account may be taken of the particular kind of service rendered by a physician. This form of restriction or limitation shall, as a rule, find application only to such physicians as have to treat a hundred patients per quarter, or, under predominatingly rural conditions, fifty patients per quarter. Of the total quarterly compensation, after deducting amounts paid for special treatments and mileage expenses (including remuneration for loss of time and carriage hire), there shall, as a rule, not more than a certain percentage, to be agreed on locally, be allowed for special services.

The following items are not to be considered in connection with the limitation of the physician's compensation: special treatments, mileage expense, the more extensive operations (which are usually performed only in the clinic), if their urgency precluded postponement, or if, concerning their performance, a previous agreement was reached with the *Krankenkasse;* also hospital treatment.

Under the general head of special treatments *(Sachleistungen)* may be included all roentgen-ray examinations and treatments, together with the medical service; light, heat and irradiation treatments; orthopedic, medicomechanical, electrophysical, baths and inhalational treatments, and massage.

Certifications of illness, and all other attests that physicians are required to make in connection with their services rendered a *Krankenkasse*, are regarded as paid for by the general compensation. The panel physician, furthermore, is expected, as the outgrowth of contract relations and without further compensation, to give the *Krankenkasse* needed information, statements in regard to the disabilities of patients, as well as all written statements arising out of his business relations with the *Krankenkasse*.

If a member of a *Krankenkasse* is referred by his society to a specialist outside of the district of the *Krankenkasse*, the fee for such service, in case no agreement in advance is reached between the physician and the *Krankenkasse*, shall be determined in accordance with the minimum fees established by the Prussian schedule of fees, unless special difficulties connected with the performance of the service or an undue expenditure of time should justify a higher fee.

For the treatment of referred members of outside *Krankenkassen*, in figuring the compensation of physicians according to the individual services performed, the same fees shall be charged as for members of the assisting *Krankenkasse;* in remunerating for the performance of medical services on the same basis as capitation fees and case fees, the minimum fees of the Prussian schedule of fees for physicians shall apply.

Very detailed regulations have been worked out to control the mileage allowance for patients who live at a distance.

SUPERVISION OF THE WORK OF THE PANEL PHYSICIANS

The supervision of the activities of the panel physicians, with reference to their financial statements, the character of the prescriptions given, etc., and also regarding certifications as to members' incapacity to work, is accomplished, inde-

pendent of the supervision of the confidential physicians engaged by the *Krankenkassen*, through an examining commission (control commission, investigation commission) appointed by the representative board of panel physicians (*die Aerztevertretung*); also the *Krankenkasse* participates in the supervising work of the control commission.

DUTIES OF PANEL PHYSICIANS

The duties of panel physicians are regulated by an instruction order which constitutes a part of the contract. The federal commission will publish a model instruction order. Until this appears, the following provisions shall be observed:

The panel physicians are under obligations to assume the entire medical care of the members of the *Krankenkassen*, not only as to the extent but also the duration of the cases. They must give the members the full service that they claim for themselves and, according to the regulations of the *Krankenkasse*, are entitled to claim for the members of their families.

Only for very important reasons will panel physicians be permitted to have their assistants or other persons substitute for them constantly during consultation hours or for medical visits. The physicians' committee will decide whether reasons advanced are sufficiently important to allow the granting of such privilege.

The panel physicians are under obligations to refuse to give unnecessary treatment, and especially with respect to the kind and extent of the medical assistance, and in the prescribing of medicines, remedies and tonics, to limit themselves to what is absolutely necessary. In fulfilling their obligations, they must avoid everything that would tend to bring about an unnecessary and superfluous demand for medical care. The federal commission contemplates issuing further detailed instructions on this matter.

The panel physicians are expected, in the prescribing of medicines, remedies, etc., to observe the principles of economy and thrift that have been established by the federal commission. In prescribing tonics, special remedies and special treatments, the consent of the *Krankenkassen* administration must be secured, except in urgent cases, which must be explained. In case of repeated violations of the recognized and accepted rules regulating the prescriptions of panel physicians, the latter will be required to make good the extra expense. If controversies arise on this point, the arbitration board provided for in the physicians' contract will have the final decision.

Prescriptions for baths, massage, spectacles, trusses or other special articles must be approved by the *Krankenkassen* administration before they are carried out.

Insured members may not be sent to a hospital without the previous consent of the executive committee of the *Krankenkasse* unless the case is urgent.

If the panel physician observes that persons who are under his care simulate illness, wrongfully allege that they are unable to work, or fail to follow the regulations pertaining to patients, particularly the regulations concerning the bearing of members during illness, the *Krankenkasse* must be informed immediately. The panel physician must examine the patient conscientiously and carefully in order to ascertain whether and how long a given patient is incapable of working, within the meaning of the health insurance contract. In this matter, the findings at the medical examination are decisive.

A special endeavor must be made to discover whether an illness is the result of either an industrial accident or an older injury. If such is the case, the fact must be noted in the certification of illness.

The *Krankenkasse* is entitled to have the patient examined at any time by a confidential physician in its employ or by the committee appointed for such purpose. The attending physician must be informed of the result of the examination. The decision of the confidential physician or the examining committee is decisive. However, the right of appeal to higher authorities may be locally agreed on. If he deems it advisable, the panel physician may himself request a confirmatory examination by the confidential physician of the *Krankenkasse* or by the examining committee. In special cases, particularly if the patient persists in certain statements for which the physician can find no objective evidence, the panel physician is under obligations to request a confirmatory examination by the *Krankenkasse* administration.

THE COMMITTEE ON MEDICAL MATTERS

For the adjudication of general matters affecting the panel physicians and the *Krankenkassen* and for the furtherance of mutual relations between the *Krankenkassen* and their physicians, a committee on medical matters (*Arztausschuss*) must be appointed in each *Krankenkasse*, in addition to the special examining committee. The committee on medical matters will be composed of an equal number of members selected from among the panel physicians and from the representatives of the *Krankenkasse*. The chairman of this committee shall be alternately a representative of the panel physicians and of the *Krankenkasse*. It shall be the duty of the committee to participate in the regulation of all matters concerning the medical care of the members of the *Krankenkassen* and the status of the panel physicians. Through suggestions, discussions and expressions of opinion on the adjustment of disability claims, the committee will seek to effect a practical and peaceful solution of all questions that arise.

The committee on medical matters (*Arztausschuss*) shall use its influence to induce the physicians with no clients or a very small number of clients, voluntarily to renounce all claims to admission to the panel of physicians.

The said committee will constitute an arbitration board to decide controversies that arise, between a *Krankenkasse* and the panel physicians, concerning the interpretation and the execution of the existing contract.

If the members of the said committee are unable to reach an agreement on a particular point, they shall choose an impartial referee to decide the question, but with the understanding that such referee shall be a person who is acquainted with the laws and regulations governing health insurance. If the members of the committee are unable to unite on a referee, the director of the insurance bureau (*Versicherungsamt*) having jurisdiction over the *Krankenkasse* shall be requested either to serve as referee or to appoint a suitable person to serve in that capacity.

The decisions of the arbitration board (*Schiedsstelle*) are final and are binding for both parties.

Any costs that arise in connection with a controversy that is referred to the arbitration board must be borne by the losing party. In matters pertaining to property rights, the contestants have access to the ordinary courts of law.

DURATION OF CONTRACT

A contract between panel physicians and a health insurance society must cover a period of at least one year. Unless, at least three months before the expiration of the lifetime of the contract, a written notice to the contrary is served by either party, it shall be understood that the contract is to remain in force for another year. In the same manner, the duration of the contract will continue to be renewable for one-year periods, unless written notice three months in advance of the expiration of the contract shall be served by either party. Any charges for the execution of papers are to be borne equally by the parties to the contract.

Marriages

WARD EDWIN NEWCOMER, McClellandtown, Pa., to Miss Norma Stuart Johnson of Richmond, Va., June 21.

WALTER GUERNSEY FREY, JR., to Miss Josephine Meredith Whitehouse, both of New York, September 12.

CORNELIUS GODFREY COAKLEY, New York, to Miss Mary Louise Perry of Rochester, N. Y., August 12.

CHARLES ARTHUR POTTER, St. Charles, Ill., to Miss Althea Whitney of Aurora, at Wheaton, August 26.

WILLIAM SAMUEL SCOTT and Miss Mary Powell Wilson, both of Fredericksburg, Va., July 31.

JOHN RANDOLPH CHITWOOD, Sylvatus, Va., to Miss Dorothy Leonard Lee of Richmond, July 19.

WILLIAM VAUGHN STANFIELD, Newton, Ind., to Mrs. Avah Knapp of Bloomfield, August 16.

CHARLES THOMAS GRATTIGE to Miss Ama Daubenberger, both of Postville, Iowa, May 20.

LINUS J. FOSTER, Ann Arbor, Mich., to Miss Frances Marie Cooney of Detroit, August 18.

GEORGE HADLEY CLARK to Miss Elizabeth Phillips, both of Oskaloosa, Iowa, June 11.

Deaths

Elbert E. Persons ● Lieutenant-Colonel, M. C., U. S. Army, Washington, D. C.; Northwestern University Medical School, Chicago, 1897; entered the regular army in 1900; served in the Philippines, at Vera Cruz, Mexico, and in the Panama Canal Zone; organized the U. S. Army Ambulance Service Training School at Allentown, Pa., in 1918; was in charge of the U. S. Ambulance Service in Italy during the World War; awarded the Distinguished Service Medal; aged 55; died, July 8, at the Walter Reed General Hospital.

Theophilus Watkins Evans ● Alexandria, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1914; member of the American Psychiatric Association; served in the M. C., U. S. Army, during the World War; superintendent of the State Colony and Training School; aged 35; died suddenly, August 25, while on a camping trip on the Calcasieu River.

William B. Cunnane ● Santa Barbara, Calif.; Medical Department University of Louisiana, New Orleans, 1881; formerly county physician and county health officer; at one time member of the Santa Ynez School Board; aged 69; died, August 21, of a self-inflicted bullet wound while suffering from ill health.

George T. Welch ● Passaic, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1868; past president of the Medical Society of New Jersey; formerly on the staff of St. Mary's Hospital; aged 79; died, August 27, of injuries received when the automobile in which he was driving was struck by a train.

George S. Robinson, Philadelphia; Jefferson Medical College of Philadelphia, 1881; resident physician to the House of Correction and the Philadelphia General Hospital for thirty-seven years and eight years, respectively, and the Masonic Home; aged 68; died, August 22, of cerebral hemorrhage.

E. Kittredge Sims ● Donaldsonville, La.; Medical Department of the Tulane University of Louisiana, New Orleans, 1894; formerly mayor of Donaldsonville, and for twelve years coroner of Ascension Parish; aged 52; died, August 30, at the Touro Infirmary, New Orleans, of pneumonia.

James Wiley Beard, Troy, Ala.; Tulane University of Louisiana School of Medicine, New Orleans, 1913; member of the Medical Association of the State of Alabama; served in the M. C., U. S. Army, in France, during the World War; aged 36; died, August 19, of pneumonia.

Joseph C. Barringer, Oskaloosa, Iowa; Starling Medical College, Columbus, Ohio, 1873; member of the Iowa State Medical Society; past president of the Mahaska County Medical Society; formerly county coroner; aged 75; died, August 27, following an operation.

Edgar James Orvis, Blackwell, Okla.; Medical Department of the University of the City of New York, 1884; member of the Oklahoma State Medical Association; formerly on the staff of the Blackwell City Hospital; aged 70; died, August 19, of heart disease.

Frederick William Klein, New York; University of Vermont College of Medicine, Burlington, 1884; member of the Medical Society of the State of New York; aged 71; died, August 10, at the New York Post-Graduate Medical School and Hospital.

Samuel P. Gurney, Bridgeport, Conn.; Yale University School of Medicine, New Haven, 1901; for twenty-two years a medical missionary in Africa; aged 64; died recently, at a hospital in Salisbury, Rhodesia, Africa, following an operation.

Walter Lowa, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1899; member of the Medical Society of the State of Pennsylvania; for nineteen years on the staff of the Wills Hospital; aged 50; died, August 14.

David Cushman Twichell ● Liberty, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1903; member of the American Climatological and Clinical Association; aged 50; died suddenly, August 12, at Keene Valley.

John Amandus Lents ● Treichlers, Pa.; Jefferson Medical College of Philadelphia, 1920; formerly on the staff of Dr. Haff's Private Hospital, Northampton; aged 27; died recently, at Palo Alto, Calif., of epidemic (lethargic) encephalitis.

Florian Krug, New York; University of Freiburg, Germany, 1882; member of the New York Obstetrical Society; formerly on the staffs of the Lenox Hill and Mount Sinai hospitals; aged 66; died, August 20, at Meran, Italy.

John Morgan ● Rochester, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1904; member of the American Association of Anesthetists, and the New York Society of Anesthetists; aged 44; died, August 29.

Frank Daniel Myers, Slate Hill, N. Y.; University of Michigan Medical School, Ann Arbor, 1887; member of the Medical Society of the State of New York; aged 63; died suddenly, August 21, of heart disease.

James W. Rifle, Meadow Creek, W. Va.; University of Louisville (Ky.) School of Medicine, 1892; member of the West Virginia Medical Association; aged 57; died suddenly, August 14, of heart disease.

Thomas P. C. Barnard, North Tonawanda, N. Y.; University of Buffalo Department of Medicine, 1892; formerly health officer of North Tonawanda; aged 53; died, August 23, following a long illness.

Herbert Samuel Pyne ● Provo, Utah; George Washington University Medical School, Washington, D. C., 1908; also a pharmacist; for four years county physician; aged 62; died, August 15, of pneumonia.

Charles Daniel Brooks, East Rutherford, N. J.; Bellevue Hospital Medical College, New York, 1893; member of the Medical Society of New Jersey; aged 56; died, August 17, at Lockwood, of sepsis.

Charles Edward Dimmock Lord ● Ruth, Nev.; Dartmouth Medical School, Hanover, N. H., 1899; aged 50; died, August 16, at the Steptoe Valley Hospital, East Ely, of meningitis, following otitis media.

Eleanor Dorcas Mann, Schenectady, N. Y.; Tufts College Medical School, Boston, 1896; member of the Medical Society of the State of New York; aged 56; died, August 27, of cerebral hemorrhage.

James Campbell Kroesen, Columbus, Ohio; Medical Department of the University of the City of New York, 1871; Civil War veteran; aged 80; died, August 22, at the Grant Hospital, of carcinoma.

Walter P. Rushin, Macon, Ga.; Southern Medical College, Atlanta, 1886; member of the Medical Association of Georgia; aged 63; died, August 15, at a local hospital, of carcinoma and diabetes.

George Francis Deal, Malden, Mass.; Medical School of Harvard University, Boston, 1893; member of the Massachusetts Medical Society; aged 53; died, August 22, of pneumonia.

Julius John Robinson, Providence, R. I.; Howard University School of Medicine, Washington, D. C., 1898; member of the Rhode Island Medical Society; aged 51; died, August 17.

Benjamin Benzion Glasgow, New York (nongraduate); member of the Medical Society of the State of New York; aged 53; died suddenly, August 27, of cerebral hemorrhage.

Foster William Bassett, Los Angeles; Chicago (Ill.) Medical College, 1889; member of the California Medical Association; aged 63; died, August 21, of cerebral hemorrhage.

Benjamin F. Mullin, Pittsburgh; Cincinnati (Ohio) College of Medicine and Surgery, 1881; also a dentist and druggist; aged 68; died suddenly, August 20, of heart disease.

Frederick Fehleisen ● San Francisco; University of Wurzburg, Germany, 1877; on the staff of the Mount Zion Hospital; aged 70; died, August 28, of angina pectoris.

William Bailey Ansley ● Saltsburg, Pa.; Jefferson Medical College of Philadelphia, 1867; past president of the Indiana County Medical Society; aged 77; died, August 20.

Galen Eugene Miller, Akron, Ohio; University of Michigan Medical School, Ann Arbor, 1923; aged 26; died, July 24, of sepsis, following the extraction of a tooth.

H. Blake Hendrix, Bonita, Texas; Medical Department, University of Tennessee, Memphis, 1890; aged 58; died, August 4, of a skull fracture received in a fall.

William J. Higgins, Sayre, Pa.; Medico-Chirurgical College of Philadelphia, 1899; died suddenly, August 20, at the People's Hospital, of cerebral hemorrhage.

Benjamin L. Hendley, Farmington, Ky.; Medical Department, University of Tennessee, Memphis, 1889; aged 76; died, August 25, of carcinoma of the stomach.

Daniel Todd, Adrian, Mich.; University of Buffalo (N. Y.) Department of Medicine, 1851; formerly mayor of Adrian; aged 96; died, August 21, of senility.

Alfred Eichler ● San Francisco; Cooper Medical College, San Francisco, 1894; aged 59; died, August 13, at the French Hospital, of cerebral hemorrhage.

William Thornton Adams, Richards, Mo.; University of Louisville (Ky.) School of Medicine, 1889; aged 59; died, August 19, following a long illness.

Charles Sauter, Louisville, Ky.; Louisville Medical College, 1870; member of the Kentucky State Medical Association; aged 76; died suddenly, August 21.

James Alfred Doane, Catskill, N. Y.; Bellevue Hospital Medical College, New York, 1865; aged 83; died recently, of myocarditis and acute nephritis.

Charles Nelson Needham ● Denver; University of Colorado School of Medicine, Denver, 1907; aged 50; died, August 15, of angina pectoris.

Thomas Newton Drake, Pittsfield, Maine; Hahnemann Medical College of Philadelphia, 1884; aged 66; died, August 16, following a long illness.

Lawrence John Cardona, Brooklyn; Long Island College Hospital, Brooklyn, 1890; aged 57; died, August 22, of cardiorenal disease.

O. O. Ayer, Arlington, Iowa; College of Physicians and Surgeons, Keokuk, 1876; aged 73; died, August 13, of cerebral hemorrhage.

John M. Hosa, San Marcos, Texas; Medical Department, University of Louisiana, New Orleans, 1871; aged 72; died, August 17.

W. T. Sandridge, Wisdom, Ky.; Kentucky School of Medicine, Louisville, 1857; Confederate Veteran; aged 94; died, August 16.

Christopher M. Ware, West Liberty, Ind.; Indiana Medical College, Indianapolis, 1871; Civil War veteran; aged 79; died, August 18.

Gerrit T. Albertus Van Hengel ● Waupun, Wis. (licensed, Wisconsin, 1916); aged 81; died, August 26, of senility.

Lawrence Ambrose Brock, Boston; Medical School of Harvard University, Boston, 1900; aged 48; died, August 15.

B. F. Fulks, Lamsburg, Va.; Medical College of Virginia, Richmond, 1896; aged 55; died, May 30, of tuberculosis.

Phelim Joseph O'Neill, New York; Medical College of Virginia, Richmond, 1912; aged 36; died, August 12.

Rudolph Von Muralt, Tiltonsville, Ohio (years of practice); also a pharmacist; aged 77; died, August 4.

Frank A. Liddell, Milano, Texas; Southern Medical College, Atlanta, Ga., 1881; aged 66; died, August 15.

George W. Highlands, Lockland, Ohio; Medical College of Ohio, Cincinnati, 1853; aged 98; died, August 2.

Louis William Eckels, Sr., Louisville, Ky.; Louisville Medical College, 1887; aged 69; died, August 13.

Thomas J. Clark, Letts, Ind.; Eclectic Medical Institute, Cincinnati, 1874; aged 75; died, August 17.

Henry Asthalter, Pittsburgh; University of Heidelberg, Germany, 1882; aged 73; died, August 9.

Clara A. Simonds, Carthage, N. Y. (nongraduate); aged 64; died, May 25, of pernicious anemia.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE JOURNAL'S BUREAU OF INVESTIGATION, OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER GENERAL MATERIAL OF AN INFORMATIVE NATURE

"P-O-4" NOT ADMITTED TO N. N. R.

Report of the Council on Pharmacy and Chemistry

The Council has authorized publication of the following report.

W. A. PUCKNER, Secretary.

"P-O-4" is the proprietary nondescriptive designation under which Lehn and Fink, Inc., New York, market a preparation alleged to be a mixture of two parts of tribasic magnesium phosphate and one part of tribasic calcium phosphate. The preparation is claimed to be a "therapeutically balanced" mixture which is "A new Antacid for symptoms of hyperacidity such as 'acid' stomach, pain, heartburn, acid regurgitation, distress and gas."

Recently reports have been published on the use of the well known chemical substances, tertiary (tribasic) calcium phosphate—included in the National Formulary as precipitated Calcium Phosphate—and the tertiary (tribasic) magnesium phosphate as a substitute for sodium bicarbonate. The claim is made that these compounds cannot render the stomach contents alkaline nor produce systemic alkalinization. It is reported that the calcium salt is slightly constipating, whereas the magnesium compound is slightly laxative and that the tendency of the patient to constipation or to diarrhea determines the nature of the compound to be used.

In order that a correct estimate of the therapeutic value of these tertiary phosphates may be gained, it is important that physicians use them under their proper names and base the selection of one or the other on the requirements of the particular patient. The use of a mixture of the two salts in fixed proportion is not in the interest of therapeutic progress.

The Council finds "P-O-4" inadmissible to New and Nonofficial Remedies because the use of a mixture of tertiary calcium phosphate and tertiary magnesium phosphate in fixed proportions under a nondescriptive name is irrational and the claim that it is "a therapeutically balanced" mixture is unwarranted.

Correspondence

"CURRENT CRITICISMS OF MEDICAL EDUCATION"

To the Editor:—Your recent editorial on this subject, and Dr. Pusey's comment, together with his masterly address as President-Elect of the Association, reveal facts which every physician needs to digest and ponder; because every day he faces social movements and notes their successful action to the hurt of our profession.

The public health propaganda in every community is now bringing into medical practice such an army of untrained, hairbrained cultists and faddists, working in and through the public schools and free clinics, that it is up to us to meet this movement by some definite plan of action.

On the other hand, the increasing difficulty of completing the present day medical requirements, and of passing the state examination for medical licensure, is forcing many worthy young men and women out of the regular medical field, into the more attractive field of easy practice and easy money, among the irregulars and public health philantropists of this time; because the socialized, gullible public now favors these faddists, and the newspapers, magazines and radio lend them publicity.

We can meet this situation only by thinking out a plan that will make premedical work and experience pay, by plac-

ing those who have inadequate training under the supervision of regular members of the American Medical Association in control of these new fields for the medical conservation of the public health.

Free public health work now being carried on in city, state and nation is surely subversive of the best interests of the profession, and a menace to the proper practice of medicine. In our large cities and in almost every community we have free obstetric service giving free advice and medicines. The Sheppard-Towner law secures free advice monthly for expectant mothers through the federal Labor Bureau. Free venereal clinics for men and women, free examinations of children in public schools, and free tuberculosis clinics complicate the picture of the gradual socialization of medicine. Is it any more right that city, state and nation should invade the field of medicine than it would be for it to take over the business of the Standard Oil Company?

May there not be a solution that will secure a gradual measure of relief in making it easier for the prospective medical student to practice medicine under the personal supervision of chosen members of the American Medical Association?

Would not the following plan be a step in the right direction? The granting of a temporary license to practice medicine to third year medical students who declare their intention to complete the regular medical course, who are taking courses in Class A medical colleges; such students to become the assistants of and be under the direct supervision and tutelage of members of the American Medical Association, and to be allowed to practice, after one year of such supervision, in the office of the supervisor and in general practice after two years of such supervision; such practice to constitute the years of internship required of such student after completing his regular course.

This plan would permit prospective medical students to pay their way through college with less difficulty. It would help supply rural communities with qualified men under adequate supervision, and place many new and worthy workers within the ranks of regular medicine.

The fact is, the practice of medicine is getting out of the hands of those who know it and wish to protect its ideals, because of a too rigid and stiff policy of education on the part of the educators and because of the public tendency toward the socialization of medicine under the guise of public health philanthropy. The plan suggested may be one that will help to restore medical practice to the position it should hold in every community, and at the same time make it easier for young men and women to get a medical education. It is offered with the hope that it may provoke a very general discussion through your columns, which shall crystallize in a plan that will work to stay the avalanche of socialized medicine which may soon engulf us, unless we take wise action.

FRANK M. WOOD, M.D., Los Angeles.

[COMMENT.—It is generally agreed that the problems referred to by our correspondent exist and that efforts for their solution are important. The differences of opinion appear to be in the methods proposed for their solution. These problems are apparently not due to the advances in medical education alone, but are intimately involved with the economic and sociological changes resulting from numerous other developments of this age. No one would dream of doing away with the automobile, the aeroplane or the radio, and it seems equally inadvisable and undesirable, even if it should be possible, to abandon the present day standards of medical education and medical licensure. Even if such retrogression should be possible, however, it would not result in solving the problems under discussion. Longfellow's statement that "new occasions teach new duties" is nowhere more applicable than in the attempt to secure the needed readjustments under present conditions. The various problems arising from the advances in medical education and practice are being studied with care. Some of them have already been solved, or are thoroughly understood, while for others, solutions may be near at hand. For those, however, which are intimately involved with other sociological and economic conditions, more time will doubtless be required before they can be worked out.—ED.]

"THE MEDICAL DEPARTMENT OF THE U. S. ARMY IN THE WORLD WAR"

To the Editor:—In a review of "The Medical Department of the United States Army in the World War, Volume XI, Surgery, Part Two" (THE JOURNAL, August 30, p. 707), the following sentence occurs: "The section on ophthalmology was prepared by Brig. Gen. George E. de Schweinitz, with the aid of Col. Allen Greenwood." This is a misstatement.

Section III, "Ophthalmology in the United States," was written by Dr. de Schweinitz. His sources of information are recorded in the introduction, and the material help he received from many officers on duty in the various ophthalmic sections of the hospitals in the United States is acknowledged in the references at the end of each chapter.

Section IV, "Ophthalmology in the American Expeditionary Forces," was written by Dr. Allen Greenwood, who was, during his service in France, senior consultant in ophthalmology, A. E. F. The references that conclude each chapter of this excellent contribution contain the sources of his information.

Had it been necessary for these officers to aid one another in the preparation of the articles referred to, they would gladly have done so. As this was not required, each is alone responsible for his section, as described in this letter, and as stated in the preface of the volume.

G. E. DE SCHWEINITZ, M.D., Philadelphia.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

COLLOIDAL BENZOIN TEST

To the Editor:—I have been trying to discover the technic and interpretations of the colloidal benzoin test for cerebrospinal fluid and its comparative value as to the colloidal gold test.

LYDIA LACEY, Superior, Wis.

ANSWER.—The technic of the colloidal benzoin reaction in the cerebrospinal fluid is described by Braxton Hicks and Pearce in the *British Medical Journal*, February 16.

1. One gram of freshly powdered Sumatra resin is dissolved in 10 c.c. of absolute alcohol. The gum benzoin must be the Sumatra gum obtained as the natural product in brown masses containing white or yellowish-white lumps. This is well shaken and let stand for forty-eight hours, then decanted and 0.3 c.c. of the clear fluid slowly added to 20 c.c. of twice distilled water at 35 C. A homogeneous suspension is thus obtained. This suspension must always be freshly prepared for each batch of tests.

2. A 0.01 per cent. solution of chemically pure sodium chlorid in water twice distilled through a glass condenser is made.

3. For each cerebrospinal fluid to be examined, a series of six or twelve test tubes is set up. Into the first tube, 0.25 c.c. of the saline solution (0.01 per cent.) is placed; into the remaining tubes, 1 c.c. Then 0.75 c.c. of the cerebrospinal fluid is measured into the first tube and 1 c.c. of the cerebrospinal fluid into the second tube; 1 c.c. from the second tube is put into the third tube and mixed thoroughly. One c.c. from the third tube is put into the fourth tube, and so on, to the next to the last tube when, after mixing, 1 c.c. is discarded. Thus, the last tube contains only saline solution, which acts as the control tube. Now to each tube, including the control, 1 c.c. of the gum benzoin suspension is added and mixed thoroughly. It is allowed to stand on the laboratory bench about twelve hours before reading.

Reading the tubes is simple, three degrees of precipitation being recognized, and these can be represented by the numerals 0, 1 and 2. In the first (0), no change occurs, the fluid remaining as in the control tube without any precipitate. The next degree (1) shows some precipitation, but the fluid still remains opaque. In the third degree (2), there is complete precipitation, the supernatant fluid being quite clear.

There are two types of readings that may be regarded as negative or normal. One type shows no change whatever, reading as 0 in all five or eleven tubes. The other types give a precipitate in tubes 7 to 9, inclusive. In these tubes the reading may be either 1 or 2.

The readings that have been considered positive, as in tabes and general paralysis, consist of three types: (*a*) complete precipitation in all tubes; (*b*) certain undoubted positives, which have shown a slight deviation from this rule but usually in Tube 11, 10 or 9; (*c*) some, which have remained opaque in the first tube or three-quarters dilution.

The authors conclude that the colloidal benzoin reaction is a simple test, very nearly as sensitive to syphilis of the central nervous system as the Wassermann reaction. They do not believe, however, that there is a characteristic "luetic" curve as contrasted with a "paretic" curve. A positive result (i. e., precipitates in Tubes 1 to 6 at least) is not obtained with any disease other than syphilis of the central nervous system so far as they were able to ascertain. Definite changes (i. e., other than a complete positive and in the absence of blood) indicate some definite pathologic change in the cerebrospinal fluid; but not all pathologic fluids necessarily show any colloidal benzoin reaction.

The authors illustrate their article by charts and tables which help one to understand this reaction. The full technic of the test may be obtained from La réaction du benjoin colloidal, by G. Guillain, G. Laroche and P. Lechelle.

AXILLARY SWEATING IN TUBERCULOSIS

To the Editor:—During 1919 and 1920, while engaged in the periodic examination of cases of tuberculosis, proved and unproved, I noticed that during examination there was frequently sweating from the axilla on one side or the other, but rarely on both. This sweating was at times profuse, but generally only moderate, and usually without knowledge of the patient. In cases in which it did occur, and in those in which it was suspected, but not bacteriologically proved, there was usually at some time sooner or later a positive sputum. It was also noted that the lung involvement was in most of the cases on the same side as the axillary sweating. This is not advanced as an original observation, but, without any extensive review of the literature, I do not recall having seen it mentioned. GEORGE R. HARRIS, M.D., Pittsburgh.

ANSWER.—Axillary sweating, both bilateral and unilateral, and with the perspiration more pronounced on the affected side, has been discerned by those giving special attention to tuberculosis. However, it seems doubtful that the symptom is sufficiently well marked to be considered a diagnostic or pathognomonic sign. Examination of the axilla of the average person with tuberculosis usually reveals more than a normal amount of moisture even while he is resting.

DEATH DUE TO AFTER-DAMP IN MINES

To the Editor:—Please give the complete change that occurs in the human body from death due to after-damp in mine explosions. What is the cause of death? What ill effects does this leave the subject after resuscitation? L. H. GREEN, M.D., JOHNSTON CITY, ILL.

ANSWER.—After-damp is a gaseous mixture of carbon dioxid and nitrogen with small amounts of carbon monoxid. The serious effects of after-damp are usually due to the carbon monoxid, which enters into direct combination with the hemoglobin of the blood.

After resuscitation there is frequently severe headache. Cases are reported in which permanent degenerative changes have been found in the tissues of the brain and central nervous system.

RESULT OF MATING BETWEEN HUMAN BEING AND ANIMAL

To the Editor:—Is there any official record of a man or a woman mating with an animal, such as a dog, cow, horse or pig, and producing offspring? An old English nurse here states that she has seen two cases—one in England (London) and one here in America of a woman having a litter of pups, one of four and the other of five. She also knows of a calf being born part human. B. R. WINDIGLER, M.D., ALEDO, ILL.

ANSWER.—There is not the slightest authentic record of such an instance, which has been proved to be physiologically impossible.

Medical Education, Registration and Hospital Service

COMING EXAMINATIONS

ARIZONA: Phoenix, Oct. 7-8. Sec., Dr. W. O. Sweek, 404 Heard Bldg., Phoenix.
CALIFORNIA: Sacramento, Oct. 20-23. Sec., Dr. Charles B. Pinkham, 908 Forum Bldg., Sacramento.
DISTRICT OF COLUMBIA: Washington, Oct. 14. Sec., Dr. Edgar P. Copeland, Stoneleigh Court, Washington.
FLORIDA: Tallahassee, Oct. 14-15. Sec., Dr. Wm. Rowlett, Citizens Bank Bldg., Tampa.
GEORGIA: Atlanta, Oct. 14-16. Sec., Dr. C. T. Nolan, Marietta.
HAWAII: Honolulu, Oct. 13-16. Sec., Dr. G. C. Milnor, 401 So. Beretania St., Honolulu.
IDAHO: Boise, Oct. 7. Dir., Mr. Chas. Laurenson, Boise.
ILLINOIS: Chicago, Oct. 7-9. Supt. of Regis., Mr. V. C. Michels, Springfield.
IOWA: Des Moines, Oct. 1-3. Sec., Dr. Rodney P. Fagen, Capitol Bldg., Des Moines.
KANSAS: Topeka, Oct. 14. Sec., Dr. Albert S. Ross, Sabetha.
MICHIGAN: Lansing, Oct. 14-16. Sec., Dr. B. D. Harison, 707-8 Strob Bldg., Detroit.
MINNESOTA: Minneapolis, Oct. 7-9. Sec., Dr. Thos. McDavitt, 539 Lowry Bldg., St. Paul.
MONTANA: Helena, Oct. 7. Sec., Dr. S. A. Cooney, Power Bldg., Helena.
NEW JERSEY: Trenton, Oct. 21-22. Sec., Dr. Alex Macalister, State House, Trenton.
NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. W. T. Joyner, Roswell.
OKLAHOMA: Oklahoma City, Oct. 7-8. Sec., Dr. J. M. Byrum, Shawnee.
RHODE ISLAND: Providence, Oct. 2-3. Sec., Dr. B. U. Richards, State House, Providence.
UTAH: Salt Lake City, Oct. 7. Dir., Mr. J. T. Hammond, Salt Lake City.
WYOMING: Cheyenne, Oct. 6-8. Sec., Dr. J. D. Shingle, 226 Citizens Bank Bldg., Cheyenne.

REPORT OF THE COMMITTEE ON EXAMINING BOARD FOR OTOLARYNGOLOGY*

G. E. SHAMBAUGH, M.D., CHAIRMAN
CHICAGO

Your committee, in cooperation with representatives appointed from the following national organizations devoted to otolaryngology—the American Laryngological Association, the American Otological Society, the American Laryngological, Rhinological and Otological Society and the American Academy of Ophthalmology and Otolaryngology—has formulated the following report recommending the establishing of a national board for otolaryngologic examinations and for issuing certificates to those deemed to be qualified to take up the practice of this special field. This report includes the recommendation for the appointment of a joint committee of ten from the organizations named above and the Section on Laryngology, Otology and Rhinology of the American Medical Association, two from each of these organizations. This committee is to constitute the American Board of Otolaryngology.

This report has been acted on favorably, first by the American Laryngological, Rhinological and Otological Society with the appointment of Dr. B. R. Shurly of Detroit, and Dr. F. R. Spencer of Boulder, Colo.; secondly, by the American Laryngological Association, which has appointed Dr. R. H. Skillern of Philadelphia and Dr. H. P. Mosher of Boston; thirdly, by the American Otological Society, with the appointment of Dr. T. H. Halsted of Syracuse, N. Y., and Dr. H. W. Loeb of St. Louis. If the Section on Laryngology, Otology and Rhinology of the American Medical Association passes favorably on the proposition, it will come before the American Academy in the autumn, and the committee should be ready to hold its first examination in connection with the academy meeting.

THE AMERICAN BOARD OF OTOLARYNGOLOGY

Object.—The object of such a board of examination is to elevate the practice of otolaryngology by establishing standards of fitness for men engaging in the practice of this

* Read before the Section on Laryngology, Otology and Rhinology at the Seventy-Fifth Annual Session of the American Medical Association, Chicago, June, 1924.

specialty, and the issuing of certificates to men who qualify under the established standards.

Desirability of Possessing the Certificate.—Such a certificate will be an assurance to the public that the possessor has had the proper preparation to engage in the practice of this specialty. Furthermore, it is proposed that after 1924 the following special societies shall require all applicants for membership to possess such certificate:

The American Otological Society,
The American Laryngological Association,
The American Laryngological, Rhinological and Otological Society,
The American Academy of Ophthalmology and Otolaryngology.

It is also proposed that the American College of Surgeons, on recommendation of its credential committee, admit without further examination the holder of this certificate.

Method.—The accomplishing of this purpose shall be vested in a board of examiners to be known as the American Board of Otolaryngology. The board is to consist of ten members, two each from the following bodies:

The American Otological Society,
The American Laryngological Association,
The American Laryngological, Rhinological and Otological Society,
The American Academy of Ophthalmology and Otolaryngology,
The Section on Laryngology, Otology and Rhinology of the American Medical Association,

these men to be selected in the same manner as are the presiding officers of their organizations. (Details of organization of board and term of office to be determined.)

Applicants for the examination and the certificate from the board are divided into three classes, according to the length of time they have practiced otolaryngology:

Class 1: Those who have practiced otolaryngology ten years or more.

Class 2: Those who have practiced otolaryngology five years and less than ten.

Class 3: Those who have practiced otolaryngology less than five years.

General Requirements Demanded of All Applicants.—1. High ethical and medical standing in their communities, and the possession of a medical degree satisfactory to the board.

2. Formal application on a blank provided, accompanied by two letters of endorsement by well known medical men.

Special Requirements for the Three Classes.

Classes 1 and 2: Men under these classes whose professional record has given them a national reputation for preeminence, or such men as have demonstrated a sufficiently high degree of expertness in the special practice of otolaryngology may be given a certificate without further requirements. All others shall be required to furnish reports of ten cases they have observed and treated. The board will determine from examination of these reports and from papers published by the applicant, as well as from his professional work in his community, whether further examination shall be required. Applicants under Class 2, in addition to the ten case reports, may give evidence of having served in otolaryngologic work in special or general hospitals or clinics which the board shall consider in determining whether further examination shall be required before issuing the certificate.

Class 3: Candidates under this head must hold a certificate of having completed in a satisfactory manner at least one year's full-time graduate work in otolaryngology in an institution which meets the approval of the board, and in addition shall have devoted another full year to the study of the specialty, serving either as resident in otolaryngology in a general hospital or as intern in a special hospital, or by taking graduate courses in centers of medical teaching or by serving as assistant to an established specialist, all of which work must meet the approval of the board.

In lieu of preparation as here outlined, an association with a man of sufficiently high standing for a period of not less than three years may be accepted at the discretion of the board.

The board shall determine after examining these requirements whether a further examination shall be required of the applicant before issuing the certificate.

The Examination.—In all cases in which the board decides on requiring a special examination in addition to the foregoing requirements, such examinations are to be practical, oral examinations at which a majority of the board shall be present. Such examinations are to be held at such time and place as the board shall decide. It is suggested that one such meeting be held in connection with the session of the American Medical Association in the spring and another in connection with the meeting of the academy in the fall. A favorable vote of a majority of the board present at the examination shall entitle the applicant to a certificate.

An applicant who fails to pass this examination may come up for reexamination after two years.

Fees.—The fee for the examination is to be $25, but its payment will not be required before the board is ready to issue the certificate.

THE CERTIFICATE OF THE BOARD:

The American Board of Otolaryngology hereby certifies that [name] a graduate in medicine of [medical school] ,having pursued an accepted course of graduate study in laryngology and having successfully passed the examining board, is properly prepared to practice the specialty of otolaryngology.

Issued ———, 192—.

———, Chairman
———, Secretary
———, ———, ——— } Signatures of other members of board

Book Notices

HANDBUCH DER KINDERHEILKUNDE. Ein Buch für den praktischen Arzt. Herausgegeben von Prof. Dr. M. von Pfaundler und Prof. Dr. A. Schlossmann. III Band. Third Edition. Paper. Pp. 773, with 210 illustrations. Leipsic: F. C. W. Vogel, 1924.

This volume considers the diseases of the digestive, respiratory and circulatory organs. Prof. Dr. R. Fischl of Prague writes on the diseases of the mouth and tonsils. Prof. Dr. A. Niemann, recently deceased, wrote a very complete and critical review of the nutritional diseases of infants. Niemann reviews the most important clinical and pathologic observations that have accumulated during a score of years. He favors Czerny's etiologic classification, which considers three sources of origin for the nutritional disturbances: (1) nutritional disturbances due to anomalies of constitution; (2) nutritional disturbances of alimentary origin, and (3) nutritional disturbances due to infection. In considering the classification of nutritional disturbances of artificially fed children, Niemann thinks that the clinical classifications, such as those included in Finkelstein's system or in Langstein's modification, are confusing and too theoretical. He believes that it would be better to simplify the clinical description and classification of this group of diseases. For this reason, the author describes the clinical course in a simple manner, and is guided by the leading symptoms that are observed at the bedside of the infant. The two main considerations are the course of the digestive processes within the gastro-intestinal tract, and, consequently, the principal symptom to be observed in this disease group is diarrhea; this main division considers the progress of the infant's development. This depends in large part on the processes in the intermediary metabolism, particularly those which deviate from the normal type. In a word, the classification is divided into two main groups: those babies who are suffering from diarrhea, and those who fail to gain weight and who show lack of development. The author, however, finds it necessary to refer frequently to the clinical types described by Finkelstein and his students, and the dietetic treatment is largely

that of the authors referred to, as well as that of Czerny. It seems unfortunate that various authors cannot agree on some unity in clinical classification, because the same material is used by all, though the nomenclature of the various disease manifestations varies with each individual writer. Hypertrophic stenosis of the pylorus is considered by Prof. Dr. Emil Feer of Zurich. Feer discusses the various theories as to etiology and clinical course, and also considers various forms of treatment, laying some emphasis on the use of the thick cereals, and finally he observes that Rammstedt's operation, the extramuscular pylorotomy, is to a large degree the egg of Columbus. In closing his chapter, he hedges by saying that his own opinion is that if breast milk is available and the proper treatment employed, most infants will recover without operation, though if the internal treatment does not succeed, operative treatment should not be delayed too long. An excellent paper on the metabolism of the nutritional diseases is contributed by Prof. L. F. Meyer of Berlin. The chapter on diseases of the nose is written by Prof. F. Göppert of Göttingen, and that on the respiratory diseases by Prof. St. Engel of Dortmund. The last chapter, on diseases of the circulatory apparatus, is contributed by Dr. A. Hecht of Vienna. This chapter considers in great detail the anatomy and physiology, as well as the development history, of the heart and the vascular system. Hecht describes at some length the heart of the new-born, and traces in minute detail the development and the changes of the heart and vascular system during childhood. The methods of cardiac examination and the clinical description of cardiac disease are given in fine detail, and show evidence of the years of thought and attention which the writer has devoted to the circulatory disorders of infancy and childhood. This volume maintains the excellent standard of the preceding volumes.

LIFE INSURANCE EXAMINATION. Edited by Frank W. Foxworthy, Ph.B., M.D., On the Staff of the Methodist Episcopal and City Hospitals. Cloth. Price, $9. Pp. 738, with 156 illustrations. St. Louis: The C. V. Mosby Company, 1924.

The author has collected a vast amount of material relative to life insurance examinations, special chapters being written by authorities in most of America's life insurance organizations. The volume begins with a most interesting chapter on the history of life insurance which, it appears, dates back to 1762. There follow chapters on group insurance and fraternal insurance, and then the business of organizing an examiners' force and the work of the examiners. Special attention is given to such subjects as the examination of women, examination with reference to special diseases, and examination of special portions of the body. Some five chapters are devoted to urinalysis, with especial reference to the finding and interpretation of albumin, casts and sugar. Problems of the South and of the tropics, difficulties relating to insurance in army service, and examinations for health and accident insurance are also considered. The final chapters concern welfare work, fraud on the examiner, the legal aspects of life insurance and the influence of occupation. Like most other composite volumes, this volume suffers somewhat from unevenness, since each specialist has felt the supreme importance of his own point of view. Dr. Foxworthy has edited carefully, however, and no single subject appears to be given undue importance. The greatest emphasis appears to be placed on the practical aspects of the work, so that the book will serve as a most useful volume for any physician interested in physical examination.

RICHTLINIEN FÜR KÖRPERMESSUNGEN UND DEREN STATISCHE VERARBEITUNG MIT BESONDERER BERÜCKSICHTIGUNG VON SCHÜLERMESSUNGEN. Von Dr. Rudolf Martin, o. ö. Professor der Anthropologie und Vorstand des Anthropologischen Instituts der Universität München. Paper. Price, 50 cents. Pp. 59, with 20 illustrations. Munich. J. F. Lehmanns, 1924.

This small volume covers compiled data from statistics gathered from a large group of children of different ages. Special emphasis is laid on figures relative to weight, height, other body measurements and stature of children school age. The material, while exhaustive, is rearranged and well tabulated, so as to give it a practical value. The plates illustrating normal and defective posture in girls and boys are good. The children studied were German.

Medicolegal

Duty to Ascertain Whether Bone Is Uniting Properly

(Anderson v. Satterlund (Minn.), 197 N. W. R. 102)

The Supreme Court of Minnesota, in affirming a judgment for $5,750 in favor of the plaintiff, says that he fractured the femur of his left leg, Nov. 19, 1921. A roentgen-ray examination showed a somewhat oblique break. The defendant testified that he placed the ends of the bone in apposition and applied a plaster cast extending the full length of the leg. Then a second roentgen-ray examination was made, which showed that the ends of the bone were together, with only a slight projection at one edge. Two or three days later, the cast was split. Strips of adhesive tape across the fissure were used to keep the cast rigid, and sand bags were placed on each side of the leg to hold it in the proper position. The defendant visited the patient from time to time, and by looking at his toes ascertained that the circulation of the blood was good. No weights were attached to the leg at any time, the defendant being of the opinion that the cast would keep the ends of the bone together. December 18, the plaintiff told the defendant that he had been moved during the night and that his leg did not feel the same as it had before. Immediately a third roentgen-ray examination was made. It showed that the ends of the bone were overriding. The plaintiff was told of this and that the bone could be rebroken and reset. He declined to have this done, his objection being that he would be kept in the hospital too long. Nothing more was done, and, January 10, the defendant was dismissed and another physician called to take charge of the case. When the defendant first saw the plaintiff, and again when the third roentgenogram was taken, he advised him to have the leg opened and a metal plate attached to the bone to hold the broken ends together; but, on being told that there might have to be a second operation to remove the plate, the plaintiff would not consent. The second physician, who characterized his subsequent treatment as "watchful waiting," was of the opinion that it was best to let the bone unite as it was. The trial of this action for damages took place, April 9, 1923. The plaintiff testified that the leg was improving, but was about 2 inches shorter than the right one, and was still weak. A physician who furnished the medical expert evidence for the plaintiff gave it as his opinion that, judged by the standards of the allopathic school of medicine, to which the defendant belonged, the plaintiff did not receive proper care and treatment because no extension weight was attached to the leg, and because the position of the broken ends of the bone was not ascertained by the use of the roentgen rays after the cast was applied.

A consideration of all the evidence leads the supreme court to the conclusion that it was for the jury to determine whether the overriding of the broken ends of the bone resulted from the defendant's failure to exercise proper care and skill. The evidence showed that in applying the cast he was following an approved method of treating a fractured femur, that it was not bad practice to use the cast without attaching a weight to the leg, and that the ends of a broken femur cannot always be kept from overriding, no matter what method is employed to reduce the fracture. The court rests its conclusion that the case was for the jury on the evidence relating to the manner in which the patient was treated after the bone was set. There was an interval of four weeks between the date when the cast was applied and the date when the defendant discovered that the broken ends of the bone were no longer in the proper position. During that period he seemed to have assumed that the cast was holding the bone in the position shown by the second roentgen-ray examination. When the ends slipped was left in doubt. It would seem that the defendant should have done something to ascertain from time to time whether the bone was uniting properly. At least the jury might find that in the exercise of reasonable care he should have done more than he did. The showing of a failure to exercise reasonable care and skill was not clear or convincing, but the evidence furnished a basis for a rational inference that there was negligence in the respect mentioned.

Anesthetist Not Responsible for Negligence of Surgeons—Patient's Husband as Witness

(Jett v. Linville (Ky.), 259 S. W. R. 43)

The Court of Appeals of Kentucky, in reversing a judgment for $1,000 obtained by plaintiff Linville against defendant Jett, says that an operation was performed on the plaintiff by two surgeons on account of a flow of blood from the uterus, which was retroverted and rendered immovable by adhesions. During the operation, the surgeons took a stitch in the mouth of the cervix and placed gauze in the vagina, but it was insisted that after the operation the gauze was removed and the stitch taken out—that the stitch could not have been reached without the removal of the gauze. A little more than two weeks afterward, the plaintiff complained to the defendant of a feeling of discomfort, which led him to make an examination in which he found protruding from the mouth of the vagina a piece of cotton or gauze about two inches long and probably about half an inch in thickness. In her petition, the plaintiff alleged that her person had been greatly irritated by this cotton or gauze; that she had suffered excruciating pain as well as great mental anguish on account of it; that she was caused to be sick and nervous, and that her health was permanently impaired.

But, after a careful review of all the testimony offered in this case, this court can find nothing of a substantial nature calculated to sustain these contentions. The fact that just six months after the operation the plaintiff gave birth to a healthy, strong, normal baby would not tend to induce or strengthen the belief that she was inconvenienced to any extent, or that she had just cause for complaint. Morever, in any event the testimony showed conclusively that the defendant could have taken no part whatever in the operation performed other than administering the anesthetic. It is a well established rule in surgical operations that the anesthetist is directly chargeable with the physical condition of the patient in the operating room, and his attention must always be directed solely to administering the proper amount of the anesthetic and continuing its supply in just such proportions as will insure the patient's remaining in a comatose condition while the knife is being used. Indeed, it is strange that in their deliberations the jury should have dismissed the surgeons and have found against this defendant, as it was forcibly demonstrated that if any of the attending physicians were responsible for the alleged carelessness and neglect, it must have been the surgeons who performed the operation, and not this defendant, who only administered the anesthetic.

At the conclusion of the plaintiff's testimony, her husband was introduced, and over the strenuous objections of attorneys for the defendant was allowed to testify in detail relative to the case, in open defiance of all precedent and directly contrary to Section 606 of the Civil Code of Kentucky. On what possible theory or state of circumstances the trial court permitted the husband to testify in this action, this court is unable to understand; but the conclusion is inevitable that the trial court erred seriously in so doing; and, if for no other reason, a reversal would be imperative. Stripped of the husband's testimony, the case should never have been permitted to go to the jury. Indeed, it would be exceedingly dangerous to permit a case of this character to go to the jury on such flimsy evidence as was woven by the plaintiff.

Distinction Between Assault and Battery of Unauthorized Operation and Malpractice

(Hershey v. Peake (Kan.), 223 Pac. R. 1113)

The Supreme Court of Kansas says that, generally speaking, certain cases announce and apply the rule that: (*a*) A person (in possession of his faculties and in such physical health as to be able to be consulted as to his condition, and no emergency existing making it impracticable to confer with him) has the right to say whether or not any contemplated surgical operation shall be performed on him; (*b*) a surgical operation performed on such a person without his consent is wrongful and unlawful and amounts to a trespass on the person and is assault and battery; (*c*) such a person may maintain an action against the surgeon for damages, if any have been sustained, because of such wrongful operation, and (*d*) such an action may be maintained though the surgeon was learned and skilful and exercised due care and skill in all he did. But this court does not find it necessary in this case to approve or to disapprove the principles announced and applied in those cases.

The question for decision here was whether or not the statute of limitations of the state had run so as to bar the action. This depended on whether the petition stated a cause of action for assault and battery or a cause of action for malpractice. If the former, the one-year statute of limitations applied, and the action was barred, as the injury complained of was alleged to have been sustained in April, 1919, whereas this action was commenced in January, 1921. But if the petition stated a cause of action for malpractice, the two-year statute applied, and the action was brought in time.

The fundamental distinction between assault and battery, on the one hand, and negligence such as would constitute malpractice on the other, is that the former is intentional and the latter unintentional. The petition in this case charged the defendant with pulling the wrong teeth and that in doing so he neglected to use reasonable and ordinary care and skill; that he carelessly disregarded the knowledge he had obtained from the examination of a roentgenogram and his own examination of the plaintiff's jaw and teeth; and that when his attention was called to the fact that he had pulled the teeth on the wrong side, he admitted it and said that he did not know why he had done so, as the picture and his own examination showed plainly which teeth were affected. The trial court rendered judgment for the defendant on the pleadings, holding that the petition stated a cause of action for assault and battery which was barred by the one-year statute of limitations; but the supreme court holds that the petition stated a cause of action for malpractice rathen than one for assault and battery, and reverses the judgment of the trial court, with directions to overrule the defendant's motion for judgment on the pleadings.

As applied to a surgical operation, the supreme court restates in its syllabus that the distinction, ordinarily, between an unauthorized operation amounting to assault and battery on the one hand and negligence such as would constitute malpractice on the other, is that the former is intentional and the latter is unintentional.

Society Proceedings

COMING MEETINGS

American Academy of Ophthalmology and Oto-Laryngology, Montreal, Canada, Sept. 15-20. Dr. Luther C. Peter, 1529 Spruce Street, Philadelphia, Secretary.
American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Cleveland, Sept. 18-20. Dr. James E. Davis, 111 Josephine Avenue, Detroit, Secretary.
American Association of Railway Surgeons, Chicago, Oct. 15-17. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.
American Child Health Association, Kansas City, Mo., Oct. 15-17. Dr. Philip Van Ingen, 125 East 71st Street, New York, Secretary.
American College of Surgeons, New York, Oct. 20-24. Dr. Franklin H. Martin, 40 East Erie Street, Chicago Director-General.
American Public Health Association, Detroit, Oct. 20-23. Mr. Homer N. Calver, 370 Seventh Avenue, New York, Secretary.
Central States Pediatric Society, Rochester-Minneapolis, Oct. 30-31. Dr. H. T. Price, Westinghouse Building, Pittsburgh, Secretary.
Colorado State Medical Society, Denver, Oct. 7-9. Dr. F. B. Stephenson, Metropolitan Building, Denver, Secretary.
Delaware State Medical Society, Milford, Oct. 14-15. Dr. W. O. LaMotte, Industrial Trust Building, Wilmington, Secretary.
Indiana State Medical Association, Indianapolis, Sept. 24-26. Dr. Charles N. Combs, 221 South 6th Street, Terre Haute, Secretary.
Kentucky State Medical Association, Louisville, Sept. 23-25. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.
Medical Association of the Southwest, Kansas City, Mo., Oct. 13-18. Dr. E. H. Skinner, Rialto Building, Kansas City, Mo., Secretary.
Minnesota State Medical Association, St. Cloud, Oct. 8-10. Dr. Carl B. Drake, Guardian Life Building, St. Paul, Secretary.
Missouri Valley Medical Society of the, Des Moines, Sept. 17-19. Dr. Charles W. Fassett, 115 E. 31st Street, Kansas City, Mo., Secretary.
Nevada State Medical Association, Reno, Sept. 12-14. Dr. Claude E. Piersall, Masonic Temple, Reno, Secretary.
Pennsylvania, Medical Society of the State of, Reading, Oct. 6-9. Dr. W. F. Donaldson, Jenkins Arcade, Pittsburgh, Secretary.
Vermont State Medical Society, Burlington, Oct. 9-10. Dr. W. G. Ricker, St. Johnsbury, Secretary.
Virginia, Medical Society of, Staunton, Oct. 14-17. Miss Agnes V. Edwards, 104½ West Grace Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL for a period of three days. No foreign journals are available prior to 1920, nor domestic prior to 1923. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested).

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Gynecology, St. Louis

8: 131-256 (Aug.) 1924

*Etiology of Congenital Structural Defects. H. J. Bagg, New York.—p. 131.
*Natural Immunity in New-Born. L. K. Musselman, New Haven, Conn.—p. 141.
Painless Childbirth by Synergistic Methods. II. J. T. Gwathmey, R. A. McKenzie and F. J. Hudson, New York.—p. 154.
*End-Results After Operations for Uterine Prolapse. H. Grad, New York.—p. 163.
*Intracranial Hemorrhage in New-Born; Significance of Yellow Spinal Fluid and Jaundice. W. Sharpe and A. S. Maclaire, New York.—p. 172.
Study of Placentas with Regard to White Infarcts. F. P. McNalley, St. Louis.—p. 186.
*Incontinence of Urine Due to Relaxed Vesical Sphincter. H. D. Furniss, New York.—p. 195.
Internal Migration of Ovum in Guinea-Pig. P. B. Kinney, Stanford University, Calif.—p. 198.
Contraindications to Radium in Treatment of Diseases of Female Pelvis. F. E. Keene, Philadelphia.—p. 201.
Fibroid Tumors. W. Neill, Jr., Baltimore.—p. 205.
*Purpura Hemorrhagica Treated with Radium and Roentgen Ray. C. Goldmark and A. W. Jacobs, New York.—p. 208.
Mixed Cell Tumor of Uterus. S. Wiener, New York.—p. 211.
Two Cases of Diaphragmatic Hernia. J. D. Clark, Wichita, Kan.—p. 216.

Etiology of Congenital Structural Defects.—Hereditary defects associated with roentgen-ray irradiation have been studied by Bagg. A group of mice from a well known homozygous strain was divided by chance into two parts. In one group both male and nonpregnant female animals were irradiated for twelve seconds on each of five consecutive days with a light dose of unfiltered roentgen rays. The animals were then mated. Those of the other groups were also mated and kept as a control. In the third generation of one of the irradiated lines an animal was found with a defective eye. Later many such animals were obtained. The defect has been found to be definitely inherited and in certain families occurs in 100 per cent. of the offspring of defective parents. The abnormality behaves as a mendelian recessive. Although the control animals have been subjected to exactly the same inbreeding as were those from irradiated parents no such hereditary abnormalities have been found. Other structural disturbances have been closely associated with the eye defect. Abnormality of the limbs, clubfeet, syndactylism and polydactylism have been most prominent. Bagg has also noted the occurrence of various kidney abnormalities in this strain, from a partial to complete absence of one kidney to congenital absence of both. The examination in utero of many young from abnormal parents has led Bagg to the conclusion that developmental defects are mainly of the nature of arrested development.

Natural Immunity in New-Born.—Musselman's studies indicate that the infant is only partially, if at all, dependent on its mother for the development of normal antibodies, or of natural immunity.

Results of Operations for Uterine Prolapse.—The study made by Grad of fifty-three cases of prolapsus uteri shows that childbirth is the cause. In 21 per cent. of the cases the prolapsus developed after the first childbirth and in 72 per cent. the prolapse is of the third degree. In 39 per cent. of the cases the prolapse came on after two or more children were born. Instrumental delivery appears to have no bearing on the cause of uterine prolapse. There were 41 per cent. of instrumental deliveries as against 59 per cent. of non-instrumental. Operation was successful in 75 per cent. of cases. The interposition operation was used in the various degrees of prolapse.

Intracranial Hemorrhage in New-Born.—Ten per cent. of 100 consecutive deliveries reviewed by Sharpe and Maclaire presented spinal fluids which contained evidences of intracranial trauma. In four cases the cerebrospinal fluid was bloody and in six cases it was yellow, in only four of which red blood corpuscles were demonstrable. The yellow spinal fluid of new-born babies is probably the result of transudation of the blood plasma when red blood corpuscles are absent, and due to minute hemorrhages when red blood corpuscles are present. Of four cases of icterus neonatorum in this series only one had yellow spinal fluid. Early lumbar puncture is advocated in the absence of shock, not only for its diagnostic but also for its therapeutic value in early cases of cerebral hemorrhage and cerebral edema. Repeated spinal drainage at least every twelve or twenty-four hours is indicated, dependent on the size of the intracranial extravasation or the amount of cerebral edema as registered by the spinal mercurial manometer. A modified subtemporal decompression and cranial drainage should be advocated only when the lumbar puncture drainage fails.

Urinary Incontinence Due to Relaxed Sphincter.—Furniss' operative experience with the cure of this form of incontinence consists of twenty-one cases, in eighteen of which the Kelly technic was used, and in three the suprapubic technic. There were no mild cases. Of the moderate class there were eight; six were successful and two were not heard from. Of the nine in the marked class, there was no report on two, one was a failure, one a partial success and five very satisfactory. Of four with complete incontinence, one was a failure, one moderately benefited, and the other two were gratifying successes. One of the latter had, in addition to the sphincter lesion, a urethrovaginal fistula due to a very difficult forceps delivery. The slightly benefited one had had four previous operations.

Radiotherapy of Purpura Hemorrhagica.—Purpura hemorrhagica following pregnancy generally ends fatally. Recovery ensued in the case cited by Goldmark and Jacobs. The authors are of the opinion that radiotherapy in some manner contributed to the favorable outcome. The most threatening phenomenon was the metrorrhagia. Radium therapy was followed by a clinical arrest of the disease which had been lasting for eighteen months, while no other method of therapy was able to produce this effect.

Journal of Urology, Baltimore

12: 93-192 (Aug.) 1924

II. Studies on Ureter and Bladder; Regurgitation of Vesical Contents. R. C. Graves and L. M. Davidoff, Boston.—p. 93.
*Effect of Prostatectomy on Fertility in Rats. Artificial Insemination. A. Strauss, Cleveland.—p. 105.
Bacteriology of Ureteral Cultures. D. W. MacKenzie and W. J. Cochrane, Montreal.—p. 113.
Renal Infundibular Stricture Producing Hydrocalyx. W. E. Lower and G. W. Belcher, Cleveland.—p. 121.
*Unilateral Kidney with Fusion of Poles. V. J. LaRose, Bismarck, N. D.—p. 127.
*Vas Function After Vasotomy. W. L. Ross, Jr., Omaha.—p. 135.
*Diathermy: Specific for Gonorrheal Epididymitis. B. C. Corbus and V. J. O'Conor, Chicago.—p. 139.
*Syphilis of Epididymis. H. C. Rolnick, Chicago.—p. 147.
*True Bilateral Hermaphrodism with Periodic Hematuria. V. G. Burden, Rochester, Minn.—p. 153.
*Primary Carcinoma of Female Urethra Treated by Diathermy. V. J. O'Conor, Chicago.—p. 159.
Traumatic Diverticulum of Urethra. I. R. Sisk, Madison, Wis.—p. 169.
Case of Vesical Bilharziasis. T. V. Williamson and E. M. Townsend, Norfolk, Va.—p. 175.
*Diverticulum of Bladder Containing Large Calculus. N. P. Rathbun, Brooklyn.—p. 181.
Diagnosis of Bladder Diverticula by Contrast Method. V. J. LaRose, Bismarck, N. D.—p. 185.
*Suprapubic Drainage Tubes. J. N. Vander Veer, Albany, N. Y.—p. 189.

Effect of Prostatectomy on Fertility.—Strauss' experiments show that either the prostate or the seminal vesicle is necessary for natural impregnation in the white rat as removal of both makes the male sterile.

Unilateral Kidney with Pole Fusion.—In the case cited by LaRose the kidneys were fused at both the upper and lower poles to form a ringlike mass with the pelves and calices situated directly opposite to the normal relations.

Function After Vasotomy.—Ross asserts that vasotomy need not be followed by occlusion of the vas, and that this is certainly not a uniform sequel of operation.

Diathermy in Gonorrheal Epididymitis.—Corbus and O'Conor regard diathermy as a method of inducing heat within the body of the epididymis, testis and spermatic cord. By using the electrode described the gonococcus can be destroyed rapidly in its local invasion, obviating prolonged inactivity or operative intervention. The authors' results with this method have been so uniformly satisfactory that they describe it as one which is specific for gonorrheal epididymitis.

Syphilis of Epididymis.—Rolnick has seen four cases of syphilis of the epididymis, one of which was considered a primary epididymitis.

True Bilateral Hermaphrodism.—Burden reports an instance of true hermaphrodism of the bilateral type, as evidenced by the presence of ovaries and testes on both sides. There was also proof of the functional activity of the two different genital glands. A careful survey of the literature failed to reveal a similar case.

Primary Carcinoma of Urethra.—In the case cited by O'Conor a very extensive urethral carcinoma was locally destroyed with subsequent complete healing of the urethral and vulval regions. Complete urinary function was retained and local symptoms were completely relieved by the procedure. It is suggested that diathermy offers a method which is superior to any previously described in effecting the local destruction of carcinoma of the female urethra.

Bladder Diverticulum.—Rathbun has operated on eleven large bladder diverticula, only one of which contained a calculus. The diverticulum was entirely filled with the calculus and densely adherent to the surrounding structures. The sac was inverted into the bladder through the dilated orifice by a combination of traction from within and careful dissection from without. The sac was amputated within the bladder, the bladder wound repaired, and the remainder of the wound partially closed with rubber tubes, and drains as usual.

Suprapubic Drainage Tubes.—Vander Veer uses rubber bands fastened to the drainage tube by means of adhesive tape to act as guy ropes and thus maintain the tube in position.

Military Surgeon, Washington, D. C.

55: 145-296 (Aug.) 1924

Neuropsychic Functions Concerned in Leadership. F. F. Hutchins.—p. 145.
*Influence of World War on Surgical Tuberculosis: America's Viewpoint. W. S. Bainbridge.—p. 164.
Affectivity. I. F. Peak.—p. 196.
Administration: Principles and Application. W. H. Bell.—p. 209.
Standardization of Biologic Stains. R. E. Scott and R. W. French.—p. 229.
*Medical Officer and Chemical Warfare. H. L. Gilchrist.—p. 244.
Clinical Studies in Military Delinquency. II. Method of Character Study Suitable for Any Station. E. King.—p. 262.

Influence of World War on Tuberculosis.—The presentation of American experience during the war and in the post-war period, with respect to surgical tuberculosis, is the main objective of Bainbridge's report. In the approximate number of 2,753,922 men, being about four fifths of the men between 18 and 30 years of age who were physically examined and whose examination furnished the statistical information on defects found in drafted men, compiled from the draft records, published by the War Department, the disease group of tuberculosis constituted 4.5 per cent. of the defects found. Altogether, 9,312 cases of tuberculosis of other organs than the lungs were recorded. Last year's admission rate of military patients to army hospitals for treatment of this disease, all forms, was 3.53 per thousand for the entire army, the total number of cases reported being 727. At the end of April, 1922, there were 11,346 tuberculous veterans hospitalized at government expense in the United States. There are now over 1,100 associations in the United States concerned with the preventive movement against tuberculosis, and the annual expenditure of these preventive organizations is over $4,000,000. The expenditure of public agencies engaged largely in the treatment of tuberculosis aggregates over $30,000,000 annually. During and since the World War, many cases of osteo-articular, glandular and urogenital tuberculosis have been observed, and these manifestations of surgical tuberculosis are now explained as the secondary evidence of a latent systemic infection with the tubercle bacillus.

Warfare Gas Disability.—Of 1,036 applications for compensation filed by ex-soldiers in the Veterans' Bureau, Washington, D. C., 352, or 34 per cent., attributed their disability to the after-effects of warfare gases, and of this number 103 did not inhale enough gas to require medical treatment. A large percentage of the number stated they did not know at the time that they were gassed, and forty-five others were so slightly gassed as to require only first-aid treatment. It seems to be an established fact in the minds of many, including members of the medical profession, that all who were exposed to the fumes of warfare gases during the great war will, sooner or later, develop tuberculosis. From a careful analysis made by Gilchrist of this entire subject that required over two years for its completion, it does not appear that lung lesions caused by gas predispose to tuberculosis, and also that it does not increase the tendency for tuberculosis to localize in the lung.

Minnesota Medicine, St. Paul

7: 535-574 (Aug.) 1924

*Tuberculosis Control in Minnesota. E. L. Tuohy, Duluth.—p. 535.
*Decline in Tuberculosis Revealed in Necropsies. H. E. Robertson, Rochester.—p. 543.
Foreign Bodies in Esophagus and Air Passages. P. P. Vinson, Rochester.—p. 546.
Etiology of Intestinal Obstruction. E. M. Jones, St. Paul.—p. 548.
Surgical Differential Diagnosis of Acute Intestinal Obstruction. F. J. Piondke, St. Paul.—p. 551.
Medical Conditions Simulating Intestinal Obstruction. J. A. Lepak, St. Paul.—p. 555.
Classification and Treatment of Hemorrhoids. W. A. Fansler, Minneapolis.—p. 556.
*Ethylene Anesthesia. J. R. Aurelius, St. Paul.—p. 559.

Tuberculosis Control in Minnesota.—Tuohy contends that as far as the average private physician is concerned, he has passed up almost entirely the matter of the treatment of the tuberculosis patient, and expects the sanatorium to look out for him indefinitely. This is fortunately as illogical as it is unnecessary. The same complaint has been made relative to insane asylums and institutions for the feebleminded, and on the whole is a reflection on the sincerity of practitioners who present an agonized protest to any suggestion of instituting various grades of "state medicine." Nevertheless this considerable segment of practice is abandoned, and the doctors furthering this plan are sincere in the belief that many well trained patients will be perfectly willing to employ their home physician and pay him for his services, provided he shows enough interest to familiarize himself with the principles involved and proceed along with the patient in the attainment of his cure. Furthermore, if every positive sputum case were under such supervision and control as to give the patient surroundings that make unlikely the infection of others, the control of tuberculosis should be just as sure as that of yellow fever where the mosquitoes are not allowed contact with the infected human.

Decline in Tuberculosis Incidence.—Among 250 complete postmortem examinations made by Robertson or under his direction during 1903-1919, inclusive, there was no evidence of tuberculosis in 30 per cent. and evidence of active tuberculosis in 27.6 per cent. with 16 per cent. of healed cases and 26.4 per cent. adhesions. Among 250 cases similarly observed by another pathologist during 1923-1924, the findings were 39.2, 6.4, 10.4 and 44 per cent., respectively. In 1,000 necropsies performed by Robertson or supervised by him in 1923-1924 at the Mayo clinic, the findings were 20.1, 4.5, 63.0 and 12.4 per cent., respectively. Analysis of these cases as to age shows that the younger generations are aquiring a total immunity in far greater degree than the older generations. In fact, if healed lesions are found in a parent, there is some ground for assuring the son or daughter of a relatively increased immunity in themselves.

Ethylene Anesthesia.—Of the 300 cases of ethylene anesthesia reported on by Aurelius, 194 were major surgical

procedures, which included 12 cholecystectomies, 20 salpingectomies, 43 appendectomies (of which 27 included general peritonitis), 22 herniotomies, 8 hysterectomies, 3 thyroidectomies, 5 ectopic pregnancies, 3 thoracoplasties and 2 gastroenterostomies. The minor surgical procedures were chiefly perineal repairs, curettements, abscesses, reduction of fractures and the like. The age limits varied from an infant, aged 2 months, to an adult male, aged 77 years. For both age extremes, ethylene anesthesia had no bad effects, but rather seemed an ideal anesthetic because of the ease and rapidity of induction, the quiet, undisturbed respiration, the regularity of the pulse during the anesthesia and the absence of any untoward postoperative symptoms such as shock, pulmonary involvement or severe vomiting. Aurelins has experienced nothing that would indicate that ethylene anesthesia is anything but the safest and most desirable anesthesia at present available for the extreme age limits. For the 300 cases, 208 hours of ethylene-oxygen gas were used, giving an average of forty-three minutes per case, with seven cases consuming more than two hours. In forty of these cases, ether was used at some stage of the operation, sometimes to aid relaxation or during induction in cases where the patient was unduly excitable or unyielding. In the great majority of cases the relaxation has been very satisfactory for practically all major procedures. The relaxation is definitely more complete than with nitrous oxid and less than with ether in some cases. The recovery from the anesthetic has been uniformly prompt in all cases, even when ether has been used. The results from ethylene anesthesia from the standpoint of postoperative nausea and vomiting have been very gratifying. Gas pains have been the source of very little complaint. The general convalescence has unquestionably been far more uneventful and definitely more rapid in the ethylene cases and the general condition of the patient, especially the first postoperative days, is better than with other anesthetics. This is a factor in speeding up the convalescence and a patient's stay in the hospital. Pulmonary conditions apparently are not affected by the ethylene anesthesia; at least it can be given with relatively very little danger. The cost of ethylene-oxygen anesthesia is considerably less than for nitrous oxid, and though more costly than ether, its many advantages definitely offset this increased cost.

Missouri State Medical Association Journal, St. Louis

21: 257-296 (Aug.) 1924

*Treatment of Nasal Ganglion in Hay-Fever. R. J. Payne, St. Louis.—p. 257.
Vesical Neck Obstructions: Author's Cautery Punch. J. R. Caulk, St. Louis.—p. 259.
Doctor in Politics. G. W. Robinson, Kansas City.—p. 268.
Cesarean Section. Q. U. Newell, St. Louis.—p. 269.
Professional Observations in South America. W. F. Grinstead, Cairo, Ill.—p. 274.
*Diabetic Gangrene of Nose. E. S. Connell, Kansas City.—p. 277.

Treatment of Nasal Ganglion in Hay-Fever.—Ganglion anesthesia has been utilized in the Washington University clinic for some years, with its application growing wider and wider until at the present time, Payne says, they have data of its influence on many forms of nasal maladies. The pronounced effect of chemicals and drugs is on the sensory and secretory apparatus. However, there is a motor influence also, as shown in the palatal arch. Many obscure head pains speedily disappear under ganglion anesthesia, to reappear and vanish again following subsequent applications, in such mathematical precision that there can no longer be any doubt as to its control. Payne has made alcoholic injections into the nasal ganglion of forty-three hay-fever cases with most satisfactory results. The results varied from an amelioration, such as to cause the individual to suffer but little discomfort, to complete relief. In three cases only was there complete failure to produce any relief whatsoever.

Diabetic Gangrene of Nose.—Connell failed to find diabetic gangrene of the intranasal structures reported in the literature. His patient was 35 years of age and had suffered from diabetes for three years. He had grown slowly worse. In 1915, he had a nasal operation which he stated was a submucous resection of the septum, and an ethmoid operation. During the early part of December, 1922, he had an attack of influenza which was followed by an attack of acute purulent bilateral ethmoiditis. A few days later the infection extended into the right maxillary antrum and he developed an erythema and induration of the skin of the dorsum of the nose and upper lid of the right eye. The ethmoid infection gradually improved under treatment. Then an ulcer appeared on the right side of the cartilaginous septum. The next day this ulcer was larger, greenish black in color, with a very foul discharge. These changes increased until the ulcer perforated the septum, the cartilage and membrane sloughing away in small masses. The perpendicular plate of the ethmoid and vomer began to slough away and the hard palate became perforated, establishing a communication between the mouth and the right maxillary antrum. The blood Wassermann reaction was negative. The patient went elsewhere to obtain insulin treatment. Eventually the sloughing ceased and apparently the necrotic areas healed.

New Jersey Medical Society Journal, Orange

21: 243-274 (Aug.) 1924

Palliation in Cancer of Cervix and of Breast. E. A. Ill, Newark.—p. 243.
Roentgen-Ray Therapy in Hemorrhagic Metropathies and Uterine Myomas. J. Roemer, Paterson.—p. 249.
Enforcing the Medical Practice Act. G. W. Whiteside, New York.—p. 254.
Diphtheria. I. W. Knight, Woodbury.—p. 259.
Uncommon Rectal Fistulas. H. Goldman.—p. 262.

New Orleans Medical and Surgical Journal

77: 63-106 (Aug.) 1924

*Reduction of Surgical Mortality. W. E. Sistrunk, Rochester, Minn.—p. 63.
Golden Rule in Medicine. W. A. Dearman, Long Beach, Miss.—p. 69.
Status of Morbidity Reporting in Louisiana. O. Dowling, New Orleans.—p. 73.
*Newer Aspects of Calcium Metabolism. L. von Meysenbug, New Orleans.—p. 77.
External Otitis: Cause and Prevention. G. E. Adkins, Jackson, Miss.—p. 80.
*Comparison of Wassermann Reactions: Kolmer, Original and Bass-Johns. F. M. Johns and W. E. Jones, New Orleans.—p. 82.
Injuries and Infections of Hand. E. D. Martin, New Orleans.—p. 85.

Reduction of Surgical Mortality.—The point especially emphasized by Sistrunk is the fact that the surgeons of the present generation should appreciate the importance of good judgment in the selection of patients for operation, the proper preparation of such patients, and the selection of an operation which may be performed without a fatal termination. It is often necessary, in desperate cases, to operate in the face of great risk, but it is a great calamity to have death occur if operation has been advised in a patient who is suffering some inconvenience from a disease, but who might live indefinitely if left alone.

Blood Calcium in Purpura, Jaundice, Etc.—In such conditions as hemophilia, idiopathic purpura, jaundice, etc., associated with prolonged coagulation or bleeding time, Meysenbug says there is no reduction of the blood calcium, hence the administration of calcium in such cases is of no benefit. In short, when the calcium level of the blood is normal, it is useless to feed calcium with any hope of securing improvement in the condition for which it is given. Tetany, active or latent, some cases of active rickets, and the uremia of nephritis comprise the group of conditions known to be associated with reduced blood calcium. Special care must be exercised in the interpretation of results of blood calcium determinations.

Comparison of Tests for Syphilis.—The 500 tests reported on by Johns and Jones were conducted by the proposed Kolmer standard, the original and the Bass-Johns methods. Sixty-three, or 12.6 per cent., were positive with all three methods. The Kolmer standard and the Bass-Johns agreed to the extent of twelve more, making seventy-five, or 15 per cent. of positives. Of the twelve specimens found positive by the Kolmer method only, six were from patients who had definite evidences of syphilis as shown by symptoms, history or spinal fluid findings. In one case there was no evidence of syphilis, and in five no history was obtained. Of the seven positive only with the Bass-Johns test, five had definite symptoms or history of syphilis, and the history of the other

two was not obtained. From the experience gained in carefully performing almost 1,000 Kolmer tests, the authors believe that the proposed Kolmer standard test gives a larger number of correct positives than former methods, and that the test is very accurate.

New York State Journal of Medicine, New York

24: 787-826 (Aug.) 1924

*Operation in Difficult Hernias; Fascial Transplant and Local Anesthesia. M. B. Tinker and H. B. Sutton, Ithaca, N. Y.—p. 787.
*Diagnosis of Bone Tumors. J. M. Hitzrot, New York.—p. 790.
Improving Hearing in Catarrhal Deafness. P. V. Winslow, New York.—p. 793.
Psychanalysis and General Practitioner. G. S. Amsden, Albany, N. Y.—p. 797.
*Dry Labor. G. L. Brodhead, New York.—p. 801.

Heraiotomy.—Reviewing operations for hernias, Tinker and Sutton have arrived at these conclusions: The Bassini operation with its modifications, such as transplanting the rectus muscle or sheath gives a percentage of recurrence far too high, particularly in direct hernias, and oblique hernias in old persons. In these cases this procedure should be abandoned. In cases in which the fascial structures at the hernial site are good, the procedure of Andrews or some overlapping method may give better results, but McArthur's autoplastic sutures laced across the posterior wall of the lower half of the inguinal canal seem best. In bad direct hernias, old oblique hernias, all recurrent hernias and ventral hernias, Gallie's procedure gives the most promise. The routine use of local anesthesia by eliminating postoperative vomiting and retching will undoubtedly reduce the number of recurrences.

Diagnosis of Bone Tumor.—Hitzrot says that a proper diagnosis of bone tumor can only be arrived at by a proper consideration of all the evidence gained from the history, clinical examination and roentgen-ray examination by consultation with the roentgenologist and pathologist. In many cases this must be supplemented by a pathologic diagnosis made from the tumor itself. Ewing believes that the therapeutic test by radiation should be applied first. Coley, Bloodgood, Codman and others believe that a proper investigation of the tumor plus the examination of the tissue by a group of competent pathologists is a safer procedure. With this latter view Hitzrot agrees, but would make a strong plea for an en bloc removal of the tumor bearing bone in suitable cases both for diagnosis and as a therapeutic measure.

Dry Labor.—A review of 182 cases convinces Brodhead that dry labor, in the absence of abnormal conditions, such as contracted pelvis, relatively large child, malpresentation, prolapse of the cord, etc., should be attended by no harmful results either to mother or child. There is no specific treatment for dry labor. Pain should be relieved in every way possible, with morphin, morphin and scopolamin, or nitrous oxid. Should uterine inertia be present, with incomplete dilation of the cervix, one can aid to greater advantage by the introduction of a modified De Ribes bag than by any other method.

Northwest Medicine, Seattle

23: 337-386 (Aug.) 1924

Problems of State Association. F. A. Pittenger, Boise, Idaho.—p. 337.
*Histogenesis and Nature of Arteriosclerosis. H. Oertel, Montreal.—p. 339.
*Early Recognition of Heart Disorders. T. H. Coffen, Portland.—p. 342.
Syphilitic Aortitis; Complications. H. B. Haskell, Seattle.—p. 345.
Heart Irregularities. R. K. Keene, Spokane, Wash.—p. 349.
*Pericarditis. I. B. Bartle, North Bend, Ore.—p. 352.
*Estimation of Glucose in Blood and Urine. H. D. Haskins and W. P. Holbrook, Portland.—p. 355.
*Posttransfusion Reactions. Comparison of Citrate and Syringe Methods. H. H. Kretzler, Seattle.—p. 358.
Preservation of Pelvic Floor in Labor. R. E. Allen, Seattle.—p. 365.
Artificial Enlarged Thymus. L. H. Smith, Portland.—p. 368.

Arteriosclerosis.—Oertel defines the arteriosclerotic process as being an expression of adaptation in relations of blood column and current to the arterial wall. It differs from the normal age period changes not fundamentally, but only in exaggerations. Its immediate cause may be found also in abnormally great distention and stretching of the vessel wall, as result of either an inherent hereditary weakness of its tone, or from excessive pressure effects on its elasticity, finally from both.

Prevention of Heart Failure.—The object of Coffen's paper is to emphasize the prevention of heart failure by early recognition of heart involvement through early symptoms and signs.

Pericarditis.—Bartle is certain that there are more cases of pericarditis that are not diagnosed than those that are diagnosed. He holds that, pericardial inflammations being almost always secondary or collaboratory to another condition either near or remote and generally of primary intensity, they are often overlooked and, unless the prime symptoms of pericarditis are present, they go on to an apparent cure unnoticed. The chronic pericardial conditions are more liable to be in conjunction with or following rheumatism or nephritic conditions than those which are a direct extension from the thoracic conditions. Hence a careful inquiry into all of the past history of the patient is essentially necessary to assist in the diagnosis of a chronic pericarditis.

Estimation of Glucose in Blood and Urine.—A simplified uniform technic for estimation of glucose in blood and urine is presented by Haskins and Holbrook, using a modification of Shaffer and Hartmann's idiometric titration method of blood sugar. The method eliminates special reagents and special technic for urine sugar. Simultaneous estimations of blood and urine sugar can be made rapidly. A special table is furnished which gives a direct reading of percentage of glucose in either blood or urine, corresponding to the cubic centimeters of thiosulphate used for titration, saving time and uncertainty in computation.

Blood Transfusion.—Kretzler regards the Lindeman syringe-cannula method as being very much superior to the citrate method of blood transfusion, as far as reactions are concerned. The syringe method is recommended as the method of choice in this operation.

Ohio State Medical Journal, Columbus

20: 481-544 (Aug.) 1924

Evolution of Gynecology. T. S. Cullen, Baltimore.—p. 484.
*Use of Tryparsamide in Neurosyphilis: Paresis and Taboparesis. S. S. Hindman, Toledo.—p. 496.
Therapeutic Abortion: Indications and Technic. S. J. Goodman, Columbus.—p. 503.
Simplified Gullstrand Diaphragm Ophthalmic Lamp in Clinical Practice. C. King, Cincinnati.—p. 508.
Epidemiologic Study of Scarlet Fever Occurring in School Children. F. M. Houghtaling, Sandusky.—p. 514.
*Case Showing Unusual Specific Gravity. S. C. Lind, Cleveland.—p. 516.

Tryparsamide in Neurosyphilis.—Hindman has found tryparsamide the most efficient remedy that has yet been offered for early paresis and other forms of neurosyphilis. He reports nine cases. In order to obtain effective results the spinal fluid must be examined frequently in every syphilitic patient and the first lumbar puncture should be made on the least suspicion of mental or nervous changes. Tryparsamide is contraindicated in cases in which retinal changes have taken place, and the eye must be watched carefully during its use. Recent reports indicate that this danger will be eliminated. In Hindman's opinion, those cases which have been treated intensively with other arsenicals do not respond very well to tryparsamide. Therefore, any patient in the course of treatment for other forms than neurosyphilis, should be placed on tryparsamide on the first evidence of nervous involvement.

High Urine Specific Gravity.—Lind reports a case in which a urine specimen showed a specific gravity of 10.63. The patient was a woman, aged 25, who was seen eighteen hours after the onset of an attack of acute appendicitis. During the past year she had had attacks of pain in the abdomen, the last one of which was diagnosed ptomaine poisoning. Operation consisted of ordinary appendectomy through a right rectus incision, a greatly inflamed retrocecal appendix being removed. The preoperative urine had a specific gravity of 10.06, with neither albumin nor sugar. Microscopic examination showed no casts, no blood, and a few pus cells. The next day the urine was reported as containing acetone in large quantity and 1 per cent. sugar. The patient was immediately given glucose and insulin, and urine specimens were saved. Of these seven or eight urine specimens one showed

the specific gravity of 10.63, while the others ran from 10.28 to 10.32. This particular specimen contained 1.6 per cent. sugar, gave a markedly positive acetone test and the blood sugar was increased to 0.25. Nothing out of the ordinary was discovered. Convalescence progressed without interruption.

Oklahoma State Medical Association Journal, Muskogee

17: 191-213 (Aug.) 1924

Symptoms of Cancer of Uterus. J. S. Hartford, Oklahoma City.—p. 191.
Pelvic Cancer Exclusive of Cancer of Female Organs. L. Long, Oklahoma City.—p. 193.
Surgical Treatment of Cancer of Uterus. L. M. Sackett, Oklahoma City.—p. 196.
Radium Treatment of Cancer of Uterine Cervix. C. O. Donaldson and G. E. Knappenberger, Kansas City, Mo.—p. 198.
Roentgen-Ray Therapy of Carcinoma of Uterus. R. H. Milwee, Dallas, Tex.—p. 201.
Medical Reserve Corps in Oklahoma. L. S. Willour, McAlester.—p. 204.

Philippine Journal of Science, Manila

24: 509-638 (May) 1924

New Malayan Species of Oliarus Stal. F. Muir.—p. 509.
Little-Known Crane-Flies from Northern Japan. C. P. Alexander.—p. 531.
*Sacrococcygeal Teratoma in Filipino Infant. L. W. Smith.—p. 613.
*Chaulmoogra Ethyl, Propyl, Butyl and Amyl Esters. G. A. Perkins.—p. 621.

Sacrococcygeal Teratoma.—In a search of the records of 9,800 necropsies, covering a period of slightly over fifteen years, from the Philippine General Hospital, the San Lazaro Public Health Service Hospital and the Manila City Morgue, Smith found only one other case of true teratoma recorded. In spite of a large sacrococcygeal tumor, labor in the case reported by Smith was normal. On the fourth day after birth gangrene of a portion of the tumor was noted, and operation was decided on as the only possible means of saving the baby's life. During the day, however, cyanosis developed, with coldness of the extremities, and "stiffness" of the muscles. The baby died ninety-two hours after birth. The tumor was covered by a delicate "downy" growth of short hair, only 1 or 2 mm. in length. It was composed of a great variety of tissues, many of which were recognizable to the naked eye. Most prominent was the bony and cartilaginous development which gives a rough framework or stroma for the other structures. It bore no resemblance to any normal fetal bones. In the interstices there were numerous cysts, lined in some instances by a smooth, shiny epithelium, in others by a shaggy, soft, friable hemorrhagic tissue not unlike mucous polypi. Again, islands of nervous tissue were seen, bearing no apparent relationship to the other tissues; some of the latter areas were also cystic in character, suggesting the ventricles of the brain, and were lined by a smooth, thin tissue. Large masses of unrelated striated muscle were definitely recognizable grossly, but apparently were without function. Fatty tissue embedded in the meshes of a loose grayish trabeculated stroma, reminiscent of areolar connective tissue, was also prominent. No definite abortive attempts to form fetal organs were found, and the whole gross appearance is that of a variety of tissues, struggling madly to outgrow one another, the whole maintained in a semblance of order by a covering of skin, which even in places has become overpowered by the purposeless proliferation of the other tissues, with resultant necrosis. The tumor was a true teratoma, a parasite, developing as a monogerminal tissue implantation; a misplacement or separation of tissues within a single individual—the so-called autochthonous teratoma, and not a bigerminal implantation or abnormal twin pregnancy.

Experiments with Chaulmoogra Oil.—Experiments on the preparation of chaulmoogra ethyl, propyl, butyl and amyl esters are described by Perkins, in which the course of the reaction between chaulmoogra oil and the alcohol was followed by means of a refractometer. The proportion of two mols of the alcohol to one molecular equivalent of chaulmoogra oil was found to be sufficient for a practical conversion of the oil into the desired ester, using sulphuric acid (0.03 mol) as catalyst. Hydrochloric acid (0.03 mol) was found less desirable as a catalyst because it caused a different equilibrium value, presumably through different distribution in the two liquid phases. Practical equilibrium was found to be obtainable by boiling for a few hours, using dehydrated alcohols. The water in 95 per cent. ethyl alcohol was found to emphasize the separation of the reaction mixture into two layers, which disadvantage can be overcome by increasing the amounts of alcohol and acid and the time of boiling. Methods used at present for the preparation of chaulmoogra ethyl, propyl, butyl and amyl esters are described and characteristics of these products given. A method is described for combining the ethyl esters with iodin in such a way as to diminish materially the irritating properties of this drug.

Radiology, St. Paul

3: 91-182 (Aug.) 1924

*Thoracic Stomach: Differentiation from Eventration and Hernia of Diaphragm. L. T. LeWald, New York.—p. 91.
Roentgen Ray in Diagnosis and Treatment of Diseases of Esophagus. P. P. Vinson, Rochester, Minn.—p. 105.
Interpretation of Early Fetal Roentgenograms. I. F. Stein and R. A. Arens, Chicago.—p. 110.
Standardization of Absorptive Powers of Roentgen Rays by Salts of Various Metals. L. J. Menville, New Orleans.—p. 118.
*Cirrhosis of Lung. L. R. Sante, St. Louis.—p. 128.
Nasal Accessory Sinuses in Infants and Children. B. Allen, Iowa City, Ia.—p. 136.
Factors in Application of Radium. W. H. Cameron, Pittsburgh.—p. 140.
Calibration of Roentgen-Ray Machines. R. Kegerreis, Rochester, Minn.—p. 141.
Madelung's Deformity: Two Cases. L. Levyn, Buffalo.—p. 145.
Radiographic Technic for Chests. E. B. Kserr, Kansas City, Mo.—p. 149.
Pulmonary Fibrosis. K. S. Davis, Rochester, Minn.—p. 150.
Roentgen-Ray Treatment Unit. E. W. Rowe, Lincoln, Neb.—p. 158.
Check Fractures. F. E. Diemer, Portland, Ore.—p. 160.
Case of Myxoma of Lung. C. G. Sutherland, Rochester, Minn.—p. 161.
Top for Testing Timing Devices. E. G. C. Williams, Danville, Ill.—p. 161.
Roentgen-Ray Film Clip. J. D. Camp, Rochester, Minn.—p. 163.
Roentgenologic Diagnosis of Pathologic Conditions of Jaw. G. B. New, Rochester, Minn.—p. 165.

Thoracic Stomach.—LeWald describes thoracic stomach as an entity of congenital origin with development of the diaphragm below it, without structural defect. A thoracic stomach remains at all times above the diaphragm. In hernia of the diaphragm the stomach may be found, at times, below the diaphragm. In thoracic stomach the short esophagus enters the stomach above the diaphragm. The duodenum passes through the opening in the diaphragm usually occupied by the esophagus. The condition of thoracic stomach is not incompatible with longevity. In eventration, the diaphragm can always be made out above the stomach, especially in lateral exposures.

Cirrhosis of Lung.—Nine cases of fibrosis of the lung are reported by Sante. Nearly all of these cases followed one of two causes, being either pulmonary in origin, following lobar or bronchopneumonia, or their complications, or having origin from a plastic fibrinous pleurisy. In no instance was the process observed as a primary lesion without evidence of previous infection. The term suggested for this condition is "chronic diffuse interstitial fibrosis of the lung."

Rhode Island Medical Journal, Providence

7: 113-130 (Aug.) 1924

Prenatal Care. P. Appleton, Providence.—p. 115.

Southern Medical Journal, Birmingham, Ala.

17: 549-638 (Aug.) 1924

*Pancreatic Enzymes in Fasting Duodenal Contents. D. N. Silverman and W. Denis, New Orleans.—p. 549.
*Bacteriology of Diarrhea in Infants. W. C. Davison, Baltimore.—p. 552.
Exciting and Predisposing Causes of Diarrhea. O. H. Wilson, Nashville, Tenn.—p. 560.
Treatment of Diarrhea. N. C. Womack, Jackson, Miss.—p. 562.
*Bacteriophage in Treatment of Bacillary Dysentery. R. C. Spence and E. B. McKinley, Dallas, Tex.—p. 563.
*Case of Tularemia. E. G. Martin, Benoit, Miss.—p. 572.
Difficulties from Administrative Standpoint in Control of Malaria. S. W. Welch, Montgomery, Ala.—p. 573.
Effect of Variation of Level of Impounded Water on Control of Anopheles Production. H. R. Carter, Washington, D. C.—p. 575.
Malaria Control in United States. L. D. Fricks, Memphis, Tenn.—p. 578.
Seasonal Incidence of Types of Malaria Parasites in Southern United States. M. A. Barber and B. Mayne, Crowley, La.—p. 583.
Spleen Index in Malaria. S. T. Darling, New York.—p. 590.
Anopheles Infection Under Natural Conditions. W. V. King, Mound, La.—p. 596.

*Periarterial Sympathectomy. J. F. Mitchell, Washington, D. C.—p. 609.
*Fracture of Neck of Femur. E. D. Martin, New Orleans.—p. 613.
Patella with Reference to Acute Fracture. H. S. Black, Spartanburg, S. C.—p. 617.
*Fractures of Larynx. T. E. Oertel, Augusta, Ga.—p. 619.
Roentgen-Ray Diagnosis in Urology. R. H. Lafferty and C. C. Phillips, Charlotte, N. C.—p. 623.
Removal of Intra-Ocular Foreign Bodies. N. M. Heggie, Jacksonville, Fla.—p. 627.

Pancreatic Enzymes in Fasting Duodenal Contents.—In summarizing their investigations, Silverman and Denis arrive at the following conclusions: Normal men give (*a*) minimum enzyme activity of lipase 0.8 c.c., amylase 1.3 mg., protease 1.3 mg., (*b*) maximum enzyme activity of lipase 2 c.c., amylase 2.6 mg., protease 2.9 mg.; patients with chronic biliary tract disease give (*a*) minimum enzyme activity of lipase 0.0 c.c., amylase 1 mg., protease 1.1 mg., (*b*) maximum enzyme activity of lipase 0.6 c.c., amylase 2.5 mg., protease 3.5 mg.; patients with chronic pancreatic disease give (*a*) minimum enzyme activity of lipase 0.1 c.c., amylase 0.0 mg., protease 0.2 mg., (*b*) maximum enzyme activity of lipase 0.8 c.c., amylase 1.8 mg., protease 1.6 mg.

Bacteriology of Infants' Diarrhea.—Although there is, as yet, no absolute proof of the etiology, it seems probable to Davison that infantile diarrhea, except bacillary and amebic dysentery, is not a primary bacterial infection, but that, as a result of changes produced by external heat or by some other cause, the gastric acidity and motility and the gastric and duodenal enzymes are reduced. Undigested and unabsorbed food is then fermented by the stool organisms, either in the small or large intestine, into irritating end products which accelerate peristalsis and produce diarrhea.

Bacteriophage in Treatment of Dysentery.—Spence and McKinley report twenty positive cases of bacillary dysentery (nine due to *Bacillus dysenteriae* Shiga, eleven to *B. dysenteriae* Flexner) which were treated with the bacteriophage. There are twelve control cases which occurred during the same epidemic which were not treated. The clinical picture in all of these cases was typical of the disease. The mortality of the twenty treated cases was 10 per cent. The mortality of the twelve untreated cases was 40 per cent. In eighteen treated cases which recovered, the symptoms disappeared on an average of 8.9 days after the onset and on an average of 5.8 days after treatment was commenced. In the control series which was not treated with the bacteriophage the average time of recovery in the eight cases which recovered was 19.3 days after the onset of symptoms and 12.8 days after hospital treatment was begun.

Tularemia.—The source of infection in Martin's case was a rabbit. While dressing the rabbit, the patient had stuck a fragment of bone into her finger. It gave her very little trouble at first, but became very painful. The case was a typical one in every way.

Periarterial Sympathectomy.—Mitchell has done this operation nine times on seven patients, the brachial artery twice and the femoral artery seven times being the point of attack. All were of the general type of Raynaud's disease. The first case has been under observation for nearly two years. Both femoral arteries were decorticated. Within forty-eight hours pain had practically ceased and the sluggish ulcers representing the stumps of the toes soon assumed a healthy appearance and have healed. From being practically bedridden the man is able to get about with comfort. The second patient had a sympathectomy on the left brachial artery in June, 1922. During the operation the hand became cold and cyanosed and remained so for twenty-four hours. He left the hospital in a week. A note in October stated that the hand was greatly improved. The four next patients were operated on in June, 1923. Two of these showed the characteristic postoperative reaction of increased heat in the hand and foot, respectively, on the morning after operation with absolute and permanent cessation of pain. Another case in which both femorals were stripped has been the least satisfactory in the group. The man still has pain, but does not need sedatives at night as he did before the operation. The fourth of these cases has been most satisfactory. This patient had been for many weeks suffering such intense pain with a gangrenous patch on his great toe that he had been forced to give up his office work and was given morphin hypodermically every night. He was almost immediately relieved. The toe cleaned up and healed quickly and he is now entirely free from pain and in excellent health. The last operation was done less than a month ago. The patient had a gangrenous toe. The immediate result was most striking. At the end of forty-eight hours healthy granulations had appeared and in two weeks the toe healed.

Fracture of Neck of Femur.—Martin reports four cases of fracture of the neck of the femur in which approximation of the fragments was maintained by screws.

Fracture of Larynx.—Oertel reports two such cases in both of which there was sudden and extreme violence. One patient made a complete recovery; the other had a total paralysis of all the muscles on the right side.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Surgery, Bristol

12:1-208 (July) 1924

Syme's Amputation. D'A. Power.—p. 1.
*Radiographic Features of Urinary Calculi. H. P. W. White.—p. 5.
*Repair of Large Abdominal Hernia by Muscle Transplantation. K. Mackenzie.—p. 28.
*Nutrition of Articular Cartilage and Method of Repair. L. K. Ito.—p. 31.
*External Duodenal Fistula: Four Cases. H. M. Rigby.—p. 43.
*Dislocation of Hip in Childhood; Relation of Trauma to Pseudocoxalgia. C. C. Choyce.—p. 52.
*Etiology of Femoral Hernial Sac. J. P. Buckley.—p. 60.
Thoracoscopy in Surgery of Chest. A. T. Edwards.—p. 69.
Hereditary Deforming Chondrodysplasia. Chondrodystrophia Fetalis. J. R. White.—p. 76.
Exposure of Humerus and Femoral Shaft. A. K. Henry.—p. 84.
*Gangrene After Ligation of Popliteal Artery. J. S. B. Stopford.—p. 92.
*Mesenteric Cysts: Two Cases. T. T. Higgins and E. I. Lloyd.—p. 95.
*Attempted Production of Ascending Renal Infection in Rabbits. S. C. Dyke and B. C. Maybury.—p. 106.
*Retroperitoneal Cysts. R. M. Handfield-Jones.—p. 119.
Actions of Radiations on Living Tissues. C. P. G. Wakeley.—p. 135.
Surgical Treatment of Osteo-Arthritis. C. M. Page.—p. 152.
Extravasation of Urine: Periurethral Abscess. H. Bailey and G. P. B. Huddy.—p. 183.
*Median Extraperitoneal Route to Ureter. K. W. Monsarrat.—p. 192.
Calculus in Pelvis of Ectopic Kidney. H. Reid.—p. 198.
Abnormal First Rib Forming Supraclavicular Tumor. C. H. Whiteford.—p. 200.
Acute Colic Intussusception in Child. W. E. Tanner.—p. 200.

Roentgenography of Renal Calculi.—The opacity of a calculus is determined by: (1) the nature of its constituents; (2) its structure; (3) its thickness. White asserts that calcium oxalate and calcium phosphate give very good shadows. They are very common constituents of urinary calculi. The high relative opacity is due to the high atomic weight of the calcium present in these salts. All the other common urinary salts give relatively poor shadows. They include the urates, uric acid and triple phosphate. Cystine and xanthine also give poor shadows in the pure state, but of slightly more opacity than the foregoing owing to the sulphur they contain. It is rare for any of the foregoing substances to be the sole constituent of a stone. This applies to cystine as well as the more common varieties. There is frequently calcium oxalate or phosphate present. The figures of different observers giving the relative incidence of different salts in calculi have frequently been conflicting. Recent observers, however, are agreed on the preponderance of calcium oxalate in renal and ureteric stones, and of uric acid and urates in bladder stones. Phosphate is found in larger proportions as a constituent of bladder stone than of renal stone. It frequently surrounds a nucleus of oxalate, or uric acid or urate. Stones of uric acid or urate in the kidney or ureter soon become mixed with calcium salts, after which they can be identified by radiogram. Exploratory operation for stone is rarely justified when a radiogram is negative. Roentgenograms sometimes fail to demonstrate vesical calculi consisting largely of uric acid or ammonium urate. Where possible, cystoscopy should always be carried out for this reason.

Muscle Transplantation for Abdominal Hernia.—In a case of abdominal hernia, with an opening 5 inches in diameter,

Mackenzie closed the defect by freeing the tensor fasciae femoris at its lower end and swinging the muscle forward and upward for a third of a circle. The result was wholly satisfactory. Mackenzie suggests that this method can be used for the most advanced types of inguinal hernia, and for certain large postoperative hernias in the midline below the umbilicus, in which the whole lower abdominal wall could be braced up by the use of the tensor muscle of each side.

Repair of Articular Cartilage.—The repair of articular cartilage in experimental work Ito describes as follows: The gap at first becomes filled with granulation tissue, which becomes fibrous, then fibrocartilaginous, then cartilaginous. The time required for the formation of the cartilage varies from weeks to months. In some specimens it appears that the reparative tissue has come from the underlying cancellous tissue, in others transitional cartilage-like tissue seems to arise in connection with the edges of synovial membrane, if the injury to the articular cartilage has approached them.

External Duodenal Fistula.—Rigby has seen four cases of this condition in twenty years and has reviewed the records of three other hitherto unpublished cases. They followed operation on the duodenum for perforated ulcer, acute diverticulitis and traumatic rupture, operation on the stomach, operation on the kidney and operation for appendix abscess.

Dislocation of Hip.—Choyce analyzes the fifty-nine cases published up to January, 1924. The varieties of dislocation were: iliac (dorsal), 40; obturator, 7; sciatic, 6; suprapubic, 3, and not stated, 3. Manipulation, usually under anesthesia, was successful in all cases in which it was tried within fourteen days from the date of the dislocation. Various operative measures were adopted. The most satisfactory route of access appears to have been by subperiosteal detachment of muscles from the great trochanter, or by detachment and subsequent fixation of the trochanter. In some cases operative clearance of the acetabulum and reposition of the femoral head was successful; in others resection of the femoral head was adopted.

Etiology of Femoral Hernia Sac.—Buckley is of the opinion that the sac of a femoral hernia is a preformed sac, and this is not formed contemporaneously with the expulsion of the viscus. The sac is aquired as a result of preperitoneal fat being herniated into the thigh through that naturally weak site in man, the crural ring, and this hernia of preperitoneal fat drags with it a small peritoneal sac. Anatomically a man is as much liable to a femoral hernia as a woman. The greater frequency of the condition in women is due to pregnancy and to the prolonged period of raised intra-abdominal pressure which that condition produces. No existing theory as to the etiology of femoral hernia accounts for the fact that among the comparatively few cases which occur below the age of 15 years, females have a two to one majority; but this fact serves to throw doubt on the embryonic theory, in that normal physiologic results suggest that the gubernaculum is a more active structure in the male than in the female.

Gangrene After Ligature of Popliteal Artery.—To provide a collateral circulation after ligation of the popliteal artery, three anastomoses in succession must really be opened up, and in view of this it appears less surprising that injuries to the popliteal artery are so commonly succeeded by gangrene. In fact, when the small size of the normal recurrent tibial arteries is also recalled, and the frequent irregularity of the posterior one remembered, it seems more surprising that sufficient blood to maintain the life of the tissues ever reaches the foot after ligation of the lower part of the popliteal artery. After ligature of the superficial femoral or popliteal above the level of the origin of the superior articular branches, only one set of anastomotic communications have to be opened up, since the blood can reach the popliteal through the main stems of the superior articular branches and pass by normal channels to the leg and foot. In injuries to the popliteal artery, the situation of the wound considerably influences the occurrence of gangrene. The occurrence of gangrene is only as frequent after obstruction of the upper third of the popliteal artery as after obstruction of the superficial femoral, but if the course from the articular branches through the popliteal to the anterior and posterior tibial arteries is impeded, the risk of gangrene is very markedly increased.

Mesenteric Cysts.—The first of the two patients whose cases are reported by Higgins and Lloyd had a typical though large mesenteric cyst. In the second case the cyst was near the upper pole of the right kidney, though it was not attached either to the kidney or to the suprarenal; its macroscopic and microscopic characters were identical with those of a mesenteric cyst. The authors suggest that this also was an example of so-called mesenteric cyst, and that it arose from remains of the Wolffian body, and hence came to occupy a situation in close relation to the kidney. If it is admitted that this cyst, which bears such a close resemblance to the mesenteric cysts, arose in this way, then it seems to lend additional support to Dowd's explanation of the origin of mesenteric cysts.

Experimental Ascending Renal Infection.—A series of experiments is reported on by Dyke and Maybury, designed, if possible, to bring about an "ascending" infection of the kidney, using the term "ascending" in the sense of an infection passing into the kidney via the lumina of the urinary passages. Attempts directed to bring about infection of the ureter from the bladder showed that the ureterovesical junction offered, under the experimental conditions, an insuperable bar to the passage of infection from the bladder upward. By direct infection of the lumen of the ureter it was found to be possible to bring about a subsequent infection of the kidney; but this infection was due, not to regurgitation of the infected pelvic contents into the renal tubules, but to direct spread through the epithelium of the renal sinus into the interstitial substance of the kidney, and under certain conditions, into the space between the kidney and its true capsule. Carmine injected into the pelvis did not pass through the renal papilla, which appeared to offer an impassable barrier to a reversal of the urinary flow. No evidence could be obtained of the possibility of the occurrence of an "ascending" renal infection.

Classification of Retroperitoneal Cysts.—A classification of retroperitoneal cysts on an embryologico-anatomic basis is made by Handfield-Jones: cysts of urogenital origin; of mesocolic origin; those arising in cell inclusions—teratomatous cysts; lymphatic cysts; traumatic blood cysts; parasitic cysts, and cysts of developmental origin in fully formed organs.

Median Extraperitoneal Approach to Ureter.—Monsarrat advocates making a median suprapubic incision down to the peritoneum, followed by extraperitoneal exposure of the ureter by peritoneal displacement.

British Medical Journal, London

2: 137-162 (July 26) 1924

Yesterday, Today and Tomorrow. J. B. Hall.—p. 137.
Method of Tissue Culture; Bearing on Pathologic Problems. A. Carrel.—p. 140.
Tooth Plate Removed from Bronchus by Inferior Bronchoscopy. E. B. Waggett and E. L. Fyffe.—p. 145.
*Case of Bilateral Renal Calculus. H. T. Mursell.—p. 146.
Fibrosis of Lungs Due to Inhalation of Asbestos Dust. W. E. Cooke.—p. 147.
Lymphosarcoma of Tonsil Removed by Sluder's Guillotine Enucleation. F. P. Sturm.—p. 148.

Bilateral Renal Calculus.—Mursell cites the case of a man who, while diving, sustained a dislocation between his third and fourth cervical vertebrae. He had a complete paralysis involving all the nerve area below the level of the injury. Breathing was solely diaphragmatic. There were paralysis of bladder and rectum and extensive bedsores over the sacrum. There was dribbling of urine and severe cystitis. The superior articular processes of the fourth cervical vertebra were removed and dislocation reduced. A stout silver wire was passed through the spinous processes of the third and fourth cervical vertebrae and tightly twisted up. The wound was closed and the head and neck immobilized. Complete recovery slowly took place, and three months later the patient was about. He subsequently served in German East Africa and also with a unit in Europe. He was seen again eight years later on account of pus and blood in the urine and a certain degree of lumbar pain, but there was no history of true renal colic. A skiagram showed large masses of calculi

in both renal areas. The left kidney being judged the better of the two, nephrolithotomy was done on that side through an oblique lumbar incision, and masses of branched phosphatic calculi were removed through a cortical incision into the kidney through pouched and thinned-out tissue, opening into the calyces which contained the calculi. The upper third of the kidney was chiefly involved and the remainder showed sound secreting tissue. The patient made an uneventful recovery from this operation. Two months later masses of phosphatic calculi were removed from the right kidney. This left a big flabby upper sac leading to the calyces which had contained the calculi. As the walls of this sac showed no evidence of secreting tissue, and as it seemed only too probable this portion of the kidney would never heal, and only leave a persistent fistula, the sac was completely resected longitudinally. Except for an attack of malaria and dysentery, from which the patient had previously suffered, no untoward event marred his recovery.

Calcutta Medical Journal

18: 731-772 (May) 1924

Epidemic Dropsy at Atrasia Village. S. L. Sarkar and S. K. Banerji. —p. 731.
Gunshot Wounds. S. K. Ray.—p. 737.
Analysis of Fifty Kala-Azar Cases. I. Basu.—p. 745.
Lesions Caused by Round Worms. D. N. Banerjee.—p. 752.

Edinburgh Medical Journal

31: 373-412 (July) 1924

*Congenital Distal Dislocation of Ulna. D. M. Greig.—p. 373.
Sacro-Iliac Strains. M. F. Forrester-Brown.—p. 392.
Diagnosis of Nonopaque Foreign Bodies in Lung. R. P. Mathers.—p. 399.
*Interarticular Dislocation of Patella. K. P. Brown.—p. 403.

Congenital Distal Dislocation of Ulna.—Greig asserts that this condition is congenital; that the primary factor is dislocation of the distal extremity of the ulna, and that all the other features are inevitable consequences of this displacement. One case is cited.

Interarticular Dislocation of Patella.—"Interarticular dislocation of the patella" is the name suggested by Brown for the displacement in which the patella becomes wedged between the articular surfaces of the femur and the tibia, with or without rupture of the quadriceps attachment. Interarticular dislocation may be further subdivided, according to whether the upper or lower border of the patella is caught. The condition is rare; only ten cases are found in the literature.

Glasgow Medical Journal

102: 1-80 (July) 1924

Tumors of Breast: Mastitis and Precancerous Changes. J. C. MacDonald.—p. 1.
Flattening of Inner Canthus After Extirpation of Lacrymal Sac. T. S. Barrie.—p. 36.
Case of Complete Lateral Sinus Thrombosis Without Signs. J. K. Love. —p. 39.

Journal of Laryngology and Otology, Edinburgh

39: 365-428 (July) 1924

Suppurative Disease of Upper Nasal Sinuses. E. M. Woodman.—p. 365.
Relation of Visual Disturbances with Affections of Nasal Cavities and Posterior Group of Sinuses. A. L. Turner.—p. 371.
Sphenoidal Sinus in Relation to Optic Nerve. W. S. Syme.—p. 375.
Retrobulbar Neuritis of Sphenoidal Sinus Origin. G. Young.—p. 381.
Visual Changes in Optic Nerve Disease. H. M. Traquair.—p. 384.
Frequency of Sphenoidal Sinus Operations. J. S. Fraser.—p. 393.
Ocular Disturbance Attributed to Nasal Disease; Improvement After Intranasal Operative Measures. J. Dundas-Grant.—p. 397.
Pathology of Inflammation of Sphenoidal Air Sinus. F. E. Reynolds.—p. 399.
Osteomyelitis of Frontal Bone: Operation: Recovery. W. Milligan.—p. 401.

Journal of Obstetrics and Gynæcology of British Empire, Manchester

31: 165-368 (Summer) 1924

Implantation of Human Ovum and Early Development of Trophoblast. J. H. Teacher.—p. 166.
Obstetric Teaching. V. B. Green-Armytage.—p. 218.
Presacral Tumors of Congenital Origin: Case. A. Galletly.—p. 226.
*Adenomyoma of Uterus with Tuberculous Infection. R. W. Johnstone. —p. 243.
*Etiology and Prognosis of Puerperal Insanity. A. W. Bourne.—p. 251.
*Bacteria of Vagina in Pregnancy. C. L. Houlton.—p. 258.
Anesthesia for Gynecology and Obstetrics. H. E. G. Boyle and C. L. Hewer.—p. 264.
Lethargic Encephalitis Occurring in Pregnancy: Two Cases Complicated by Albuminuria. S. B. Herd.—p. 267.
Case of Salpingocecal Fistula with Partial Prolapse of Fallopian Tube Into Cecum. M. H. Phillips.—p. 272.
Fetus Peromelus. W. B. Bell.—p. 274.
*Prolonged Retention of Hydatidiform Mole in Uterus. W. B. Bell.—p. 276.
*Hydatidiform Mole Associated with Amenorrhea for Nine Months. J. St. G. Wilson.—p. 278.
Cervical Dilator. D. Dougal.—p. 280.
Case of Uterus Duplex with Adenomyoma. L. H. Williams.—p. 286.
Case of Combined Carcinoma and Tuberculosis of Uterus. G. I. Strachan.—p. 289.

Adenomyoma of Uterus with Tuberculous Infection.—In Johnstone's case the uterus presented simultaneously (1) two diffuse adenomyomatous tumors in its posterior wall, clearly of endometrial origin, and (2) disseminated tuberculous infection, alike of the endometrium, the muscular wall, the tumor growths, and certainly the left tube—possibly also the right. The origin of the tuberculous infection was in all likelihood blood-borne, secondary to some old-standing tuberculous focus in the lungs. The infection settled more in the endometrium of the body of the uterus than in the tubes. From the endometrium it seems to have passed into the wall of the uterus, and judging from the much greater prevalence of the tubercles in the cellular mantle around the gland elements of the tumor, as compared either with the endometrium or with those portions of the wall of the uterus not affected by the tumor, it seems legitimate to argue that the glandular prolongations into the adenomyoma have provided the tuberculous disease with a ready access to the tumor, and have indeed proved to be areas of a diminished resistance which has determined the settlement of tubercle bacilli in them.

Etiology of Puerperal Insanity.—Sixty-one cases of puerperal insanity were analyzed by Bourne. Uterine infection, with or without blood infection, accounted for eighteen, 27 per cent., and of these eighteen, thirteen were serious, some of them proving fatal. Of the sixty-one confinements there were nine cases of eclampsia, or 13.5 per cent. There were eight cases of difficult labor with various conditions, including severe hemorrhage, manual dilatation of the cervix and extraction with the forceps. As to the influence of an unstable mental equilibrium and a bad family history, there were eighteen cases. Thus of all the cases more than one quarter gave signs of a predisposition to mental disease. Four of the eighteen patients were epileptic. In four there was a history of previous sojourns in an asylum, while five had suffered puerperal insanity after previous confinements, and five came of a stock in which insanity had appeared in former years.

Bacteria of Vagina in Pregnancy.—Houlton found that in the vaginal secretion of the majority of pregnant women *Bacillus vaginalis*, accompanied in some cases by the yeast fungus, is the only organism present; but, in a minority of cases, in which the secretion is described as pathologic other organisms are present. The pathogenicity of these organisms is not proved, but they must be regarded as "suspect." In cases in which pregnant women are found to have a pathologic looking vaginal secretion a full bacteriologic examination should be made, and if gram-positive cocci are found it is suggested that an autogenous vaccine should be prepared and given during the last weeks of pregnancy, as a prophylactic against puerperal infection.

Prolonged Retention of Hydatidiform Mole in Uterus.—In Bell's case a mole in which hydatidiform degeneration of the villi was present had been retained in the uterus for ten months after it ceased to develop owing to "hemorrhages" in the choriodecidual space. These "hemorrhages" produce in connection with the hydatidiform mole a condition similar to that seen in the ordinary blood mole.

Hydatidiform Mole Associated with Amenorrhea.—On bisection of the specimen from Wilson's case an amniotic cavity was disclosed in the interior of the mole, containing a fetus 12 mm. in length attached to the wall of the cavity by the umbilical cord on which was a small cyst.

Journal of State Medicine, London

32: 301-350 (July) 1924

Proceedings of Bordeaux Meeting of Royal Institute of Public Health. Burnham.—p. 303.

Journal of Tropical Medicine and Hygiene, London

27: 199-210 (July 15) 1924

*Yellow Fever in Africa. W. H. Hoffmann.—p. 199.

Lime Salts in Kidney in Yellow Fever.—In nearly all of thirty cases of yellow fever, Hoffmann found lime salts in the kidney in the contorted tubules and in Henle's loops. He regards this finding as being a simple and reliable anatomic method for the diagnosis of yellow fever, perhaps superior to all others because it does not occur in similar diseases. He recommends, in lethal cases, to make the examination for lime casts in the kidney in sections stained with hematoxylin.

Medical Journal of South Africa, Johannesburg

19: 347-376 (June) 1924

*Case of Anthrax Meningitis. J. H. H. Pirie.—p. 348.
Plague. D. C. Rees and J. A. Mitchell.—p. 350.
Guaiacol Chlorid as Internal Antiseptic. J. Maberly.—p. 355.
Law and Doctor in South Africa. III. H. De Villiers.—p. 357.

Anthrax Meningitis.—Pirie's patient was ill only three days with a feverish condition which had been regarded as influenza, but no great importance had been attached to the illness until he was found unconscious, with stertorous breathing and a definite rigidity of the right side of the body. There was no rise of temperature. A small septic sore was observed on the chin, and the information was volunteered that he had cut himself shaving some three or four days previously. The appearance of the sore was not in the least suggestive of an anthrax pustule and no suspicion of anthrax was entertained at this time. The man died within an hour of admission to the hospital, before any detailed examination was undertaken. Numerous anthrax bacilli were found in smears made from the sore on the chin, the meninges, the duodenal mucosa and the retroperitoneal glands, their character being confirmed by cultural and inoculation tests. The dura mater was unusually tense and everywhere of a purplish tint from the presence of blood underneath it and showing through. On reflecting the dura, the vertex of the cerebrum was seen to be almost uniformly covered by a thin layer of blood which lay, not between the dura and pia mater, but entirely in the meshwork of the pia-arachnoid and could be stripped off completely with the latter. The whole cerebrum was studded with hemorrhagic areas. The case demonstrates the dramatic rapidity with which the disease develops. In this instance the illness was at most of four days' duration. The case in all probability was one of shaving brush infection. The route of infection of the meninges has been described sometimes as being by the blood stream, but more commonly by lymphatic spread. In this case the absence of facial edema and the presence of lesions in the intestine also suggest that the spread was probably a blood one.

Practitioner, London

113: 1-68 (July) 1924

Insulin. W. H. Willcox.—p. 1.
*Chronic Dyspepsia in Childhood. C. E. Sundell.—p. 13.
Impotency and Sterility in Male. M. W. Browdy.—p. 19.
Pitfalls in Roentgen-Ray Interpretation. W. Cotton.—p. 30.
Roentgen Rays and Physiotherapy in General Practice. J. McGinn.—p. 43.
Importance of Electrical Reactions. L. D. Bailey.—p. 52.
Present Position of Parathyroid Therapy. M. Critchley.—p. 56.

Chronic Dyspepsia in Childhood.—No case of chronic indigestion in a child, apart from those due to special causes mentioned, Sundell asserts, should fail to yield to treatment on general lines, but until a proper habit of stomach and bowel control has been established drugs may be necessary. They should be regarded merely as temporary measures, and the child should be released from their discipline as soon as possible.

Quarterly Journal of Medicine, Oxford

17: 319-423 (July) 1924

*Achlorhydria and Hydrochloric Acid Therapy in Pernicious Anemia. M. E. Shaw.—p. 319.
*Auricular Fibrillation in Thyrotoxic Conditions. T. P. Dunhill, F. R. Fraser and A. W. Stott.—p. 326.
*Metabolism in Undernourished Infant. G. B. Fleming and H. S. Hutchison.—p. 339.
*Congenital Pancreatic Disease with Infantilism. C. Clarke and G. Hadfield.—p. 358.
Tularemia in Man from Laboratory Infection: Three Cases. J. C. G. Ledingham and F. R. Fraser.—p. 365.
*Progressive Lenticular Degeneration. J. G. Greenfield, F. J. Poynton and F. M. R. Walshe.—p. 385.
*Acid-Base Equilibrium of Blood: Alkalemia. A. W. M. Ellis.—p. 405.

Achlorhydria and Hydrochloric Acid Therapy in Pernicious Anemia.—Five cases of Addison's anemia were investigated by Shaw. The achlorhydria in these cases was absolute and could be measured. Theoretical considerations based on the estimation of the degree of achlorhydria suggest that about 2 drams of dilute hydrochloric acid would remedy the defect. Experimental evidence shows that 1½ to 2½ drams will restore the effective germicidal activity of the gastric juice in Addison's anemia if given by the "continuous" method.

Auricular Fibrillation in Thyrotoxic Conditions.—The observations reported on by Dunhill, Fraser and Stott were made in fifteen cases of thyrotoxic auricular fibrillation. No cases that presented evidence of valvular heart disease were included. There were four cases of transient auricular fibrillation and eleven cases of persistent auricular fibrillation. The auricular fibrillation was persistent previous to treatment. In two of the cases of persistent auricular fibrillation the abnormal rhythm was associated with but slight evidence of general thyrotoxicosis. In three of the cases of persistent auricular fibrillation a return to a stable sinus rhythm occurred after partial thyroidectomy. In two of them this did not occur until three months after the operation. In four of the cases of persistent auricular fibrillation quinidin produced a stable sinus rhythm following the improvement in the thyrotoxic condition that occurred without operative treatment. A similar result was obtained in a case that later required operative treatment. In one case of persistent auricular fibrillation the thyrotoxic condition has not improved under medical treatment, and the sinus rhythm that results from quinidin is transient. Transient or unstable sinus rhythm resulted from quinidin in two cases during severe thyrotoxic activity, but stable sinus rhythm resulted in both after quinidin, when the thyrotoxic condition had improved as the result of partial thyroidectomy in one of them and of medical treatment in the other.

Metabolism in Undernourished Infant.—Although gastro-intestinal disturbance is one of the causes which may bring about marasmus, another is undernutrition due to a diet deficient in quantity. Fleming and Hutchison found that in the absence of gastro-intestinal disturbance, there is no evidence of defective absorption or abnormal utilization of food in marasmus. The metabolic picture in marasmus is identical with that of undernutrition whatever the cause.

Congenital Pancreatic Disease.—Clarke and Hadfield report the case of a child, aged 4 years, who had suffered from fatty diarrhea since birth. She was undersized and underweight, passed large, bulky, unformed and obviously fatty stools, but had never been jaundiced; the liver was greatly enlarged. Death from an intercurrent infection took place. The post-mortem examination confirmed a presumptive diagnosis of pancreatic disease, showing an extensive atrophy of the pancreas without obvious primary cause; the liver was extremely fatty and the colon dilated and thickened.

Progressive Lenticular Degeneration.—Greenfield, Poynton and Walshe report the following case: Following a trivial injury to one foot a previously healthy girl of 14 developed an inability to keep her mouth closed, dribbling of saliva and progressive dysarthria. A year from onset she was observed to have an immobile masklike countenance, spasmodic weeping and laughter, a half opened mouth from which saliva trickled, limitation of range and rapidity of movement of facial muscles and tongue and a maintained flexion attitude of the arms and hands. There was no paralysis, nor any rigidity of the limb or trunk muscles. The reflexes and sensation were normal. During the last eight months of life these symptoms progressed and she became completely anarthric, developed dysphagia, increased frequency and intensity of spasmodic weeping and laughing, rigidity of the facial and upper limb

muscles, a general flexion attitude of the trunk and limbs, tremor of the hands, and finally rigidity and ample slow flexion-extension movements of the lower limbs. Death occurred in the twentieth month of the illness. The malady ran an afebrile course, and there were no symptoms referable to any hepatic lesion. The periphery of the cornea showed a zone of greenish haziness. Pathologically, the liver showed a profound atrophic multilobular cirrhosis. Naked eye examination of the brain revealed marked shrinkage of the corpus striatum, involving the putamen and caudate nucleus, the globus pallidus remaining normal in bulk. The affected areas looked granular in texture. Microscopic examination of the brain revealed degeneration of the nerve cells in the putamen and caudate nucleus, with neuroglial overgrowth. Similar but much slighter changes were present in the globus pallidus and nucleus ruber. Marchi staining revealed degeneration in the tracts leading from the putamen to the nucleus ruber and corpus luysii and also of the posterior longitudinal bundle and superior cerebellar peduncle. The corneal pigmentation was due to the presence of fine brown granules in Descemet's membrane at the periphery of the cornea.

Acid-Base Equilibrium of Blood.—Four cases of alkalemia are reported by Ellis, two due to overdosing with sodium bicarbonate, and two due to a high intestinal obstruction. A fifth case of low intestinal obstruction is added for comparison. The results of chemical investigations of the blood and urine of these five cases are given. The theory is advanced that the ketonuria of alkalemia is due to anoxemia. The opinion is expressed that the disturbance of the acid-base equilibrium to the alkaline side may well prove more important in disease in man, than those in the opposite direction which have hitherto received our almost exclusive attention. The successful treatment of alkalemia by the administration of ammonium chlorid per rectum is reported.

South African Medical Record, Cape Town

22: 271-294 (June 28) 1924

"Blackwater Fever." O. E. Jackson.—p. 273.
Opacities in the Vitreous. F. H. Robinson.—p. 286.
Mitral and Aortic Disease After Recovery from Auricular Flutter. H. L. Heimann.—p. 287.
Malaria Treatment of Progressive Paresis. J. M. Moll.—p. 288.

Tubercle, London

5: 465-512 (July) 1924

*Treatment of Tuberculosis of Bones and Joints. G. R. Girdlestone.—p. 465.
*Interrelations of Pulmonary Tuberculosis, Influenza and Pneumonia. W. H. Dickinson.—p. 479.
Output of Urea During Acclimatization to High Altitudes. A. F. Bill and F. H. Healey.—p. 490.

Tuberculosis of Bones and Joints.—Girdlestone stresses the point that a tuberculous focus in a bone or a joint is the obvious part of a deep-rooted disease, serious in itself, crippling if there is delay, disastrous if there is neglect; but it is also evidence of tuberculous infection of the body which preexisted but is now gaining the upper hand. On the other hand, modern treatment with its artistic use of rest, food and weather, if started in good time and kept up long enough will almost always bring about a cure—a cure that skilled after-care will make permanent. Thus the crippling and disaster can be forestalled, and a lifetime of health and activity take their place. This treatment necessitates a special open-air hospital and a staff experienced and technically expert; but there is no need to transplant a patient from his home climate to a distant hospital. Rather is a hospital in the district twice as good as one in the distance, for it will admit its patients early, follow them home when they go out, take watchful care of them, and spare no effort to make their cure complete and final.

Incidence of Influenza and Pneumonia in Tuberculous.—Dickinson reports on an inquiry made to ascertain the incidence of influenza and pneumonia on 536 tuberculous patients attending a dispensary, and their home contacts. Two hundred, or 37.3 per cent., stated that they had suffered from influenza, whereas of the 2,386 other members of their households, 616, or only 25.8 per cent., have a history of having had the disease since June, 1918. Thus, of the 2,922 persons included in the scope of this investigation, 816 were reported to have had influenza, and forty-one of these had pneumonia, of whom nineteen died, giving a pneumonia incidence of 4.8 per cent. and a case fatality rate of 2.3 per cent. Acute influenzal pneumonia was found to be followed by pulmonary tuberculosis in a greater proportion of instances than was lobar pneumonia; the total number of cases, however, was small and there was no evidence that influenza proper was a serious factor in increasing the morbidity of tuberculosis. Many of the definite cases suffered an aggravation of their disease as a result of an attack of influenza, and two patients with an artificial pneumothorax died of acute influenzal pneumonia.

Annales de l'Institut Pasteur, Paris

38: 529-650 (July) 1924

Choking of Silkworm Cocoons. G. Bertrand.—p. 529.
*Specific Dressings. A. Besredka.—p. 565.
*Tuberculous Infection in Rabbits. E. Coulaud.—p. 581.
The Streptococcus of Glanders. Brocq-Rousseu et al.—p. 598.
*Flocculation in Diagnosis of Syphilis. Demanche and Guenot.—p. 625.
*Hydrophobia Vaccinations in 1923. J. Viala.—p. 648.

Specific Immunizing Dressings.—Besredka produced in animals only a slight immunity by subcutaneous injections of a staphylococcus vaccine. No protective action was obtained with injections of streptococcus vaccines except when injected into the skin. Filtrates from eight day old cultures applied in dressings protected the animals within one day after this procedure. The protective substance is thermostable (stands heating to 60 C. for one hour). Clinical results with local application of such vaccines (instillation into the ear, tampons in the uterus) gave excellent results. Thus the inefficiency of vaccination with streptococci was due to the wrong way of application. The principle is to apply the vaccine directly to the receptive tissues thus inducing their local immunity without the necessity for production of humoral antibodies.

Tuberculous Infection in Rabbits.—Coulaud observed seventeen instances of tuberculosis in rabbits living in the same cage with tuberculous neighbors. He believes that the disease was contracted through the alimentary tract. In spite of this, the first visible lesions developed in the lungs, here as well as in other experiments.

Flocculation in Diagnosis of Syphilis.—Demanche and Guenot performed 2,500 syphilis tests with Vernes' flocculation method. Its advantage is specificity, quantitative results and a comparatively easy technic, especially in long series of tests. It is, however, less sensitive than the Wassermann or, especially, the Hecht method.

Hydrophobia Vaccinations in 1923.—All of the 1,481 patients subjected in Paris in the last two years to preventive inoculation against hydrophobia were successfully protected.

Annales de Médecine, Paris

16: 5-83 (July) 1924

Histopathology of Multiple Sclerosis. G. Marinesco.—p. 5.
*Idiopathic Megadiaphragm. L. Bard.—p. 26.
*Anergy in Liver Disease. N. Fiessinger and P. Brodin.—p. 46.
*Erythromelalgia. E. May and P. Hillemand.—p. 51.

Idiopathic Stretching of the Diaphragm.—Bard emphasizes that the diagnosis of abnormal length of one half of the diaphragm in all diameters is made only by the roentgen rays. The megadiaphragm involves almost exclusively the left half of the diaphragm, and affects males in 75 per cent. of the cases.

Anergy in Liver Disease.—Fiessinger and Brodin ascribe to anergy the increased susceptibility to tuberculosis in liver disease. Thus a chronic nontuberculous affection of the liver may favor invasion by tubercle bacilli, and aggravate an encapsulated tuberculosis, owing to defective protection of the organism, from the insufficiency of the liver.

Erythromelalgia.—May and Hillemand have compiled 160 cases of organic, reflex or functional erythromelalgia. The list includes an infant and a man of 92. Tentative treatment for syphilis cured two of their personal cases; organotherapy aided in others; severing the posterior roots involved has given conflicting results.

Archives des Maladies du Cœur, Paris

17: 401-480 (July) 1924

Permanent Septal Bradycardia. E. Donzelot and E. Géraudel.—p. 401.
The Dual Automatism of the Heart. E. Donzelot.—p. 409.
Chronic Myeloid Leukemia in Woman of 68. Sabrazès.—p. 415.
Pernicious Anemia in Endocarditis. Courtois-Suffit et al.—p. 418.
Hippocratic Fingers with Aneurysm. A. Hanus.—p. 425.

17: 481-544 (Aug.) 1924

*Primary Hypertrophy of the Heart. L. Bouchut and Bonafé.—p. 481.
Shadow of Enlarged Heart in Radioscopy. Bordet and Giroux.—p. 494.
Cardiac Rhythm in Paroxysmal Tachycardia. L. Gallavardin et al.—p. 500.
Cardiovascular Complications of Acute Nephritis. C. Lian and J. Haguenau.—p. 506.

Primary Hypertrophy of the Heart.—Bouchut and Bonafé describe an essential hypertrophy of the heart, primary, of infectious or toxic origin. This hypertrophy represents a grave cardiopathy without any histologic changes, a *myocardite hypertrophique*. It is not associated with arterial hypertension, and may coexist even with hypotension.

Comptes Rendus de la Société de Biologie, Paris

91: 517-612 (July 25) 1924

Treatment of Neurosyphilis with Tryparsamide. H. Claude and R. Targowla.—p. 527.
*The Blood in Malignant Disease. J. Lavedan.—p. 530.
*Radiosensitivity Reduced by Ligature. J. Jolly.—p. 532.
*Splenectomy Increases Glycemia. H. Bierry et al.—p. 537.
Gastric Leukopedesis and Intolerance of Food. Lorper and Marchal.—p. 547.
Sugar Content of Arterial and Venous Blood of Organs Before and After Insulin. P. Mauriac and E. Aubertin.—p. 554.
*Survival of Tubercle Bacilli in Books. Moureau and Touchais.—p. 560.
*Echinococcosis in France. P. Desoil.—p. 570.
Influence of Epinephrin on Phosphorus and Calcium Content of Blood. P. Woringer.—p. 588.
Direct Action of Secretin on Surviving Organs. Troteano.—p. 590.
Research on Ultrafiltrated Plasma. Hirth and Tschimber.—p. 592.
Physical State of Blood Sugar. Delaville and Quittner.—p. 595.
*Minerals in Blood in Osteomalacia. L. Blum et al.—p. 599.
*Antagonistic Action of Pituitary Extracts. J. La Barre.—p. 601.
*Swallowing of Amniotic Fluid by Embryo. S. Vrbitch.—p. 604.
*Roentgen Rays and Growth. Ancel and Vintemberger.—p. 606.
*Action of Roentgen Rays on Epistaxis. G. Canuyt and M. Wolf.—p. 611.

Blood Changes with Cancer.—Lavedan's research on 200 cases of epithelioma without cachexia showed only inconstant and not pronounced changes in the blood. The blood seems to be for a long time neither disturbed nor affected by the malignant tumor. The changes are due to a complication.

Effect of Ligature on Radiosensibility.—Jolly succeeded in diminishing the reaction to irradiation of the popliteal gland by ligating the afferent arteries. Shutting off the blood supply seemed to produce changes in the metabolism and function of the cells. It suggests the idea that, by inducing physiologic changes in the cells, it may be possible to increase or to lower the radiosensibility of organs.

Effect of Splenectomy on Glycemia.—Bierry, Rathery and Levina's experiments on dogs proved that splenectomy affects the glycemia, producing a more or less persistent increase of the free and the proteid sugar.

Vitality of Tubercle Bacilli in Books.—Experiments with pages of books contaminated by tuberculous sputum proved to Moureau and Touchais that the time of the school vacation is not long enough to make the tubercle bacilli inoffensive. Inoculations in guinea-pigs were still virulent after a period of 130 days.

Alveolar Echinococcosis of Liver in Man.—Desoil observed in northern France a patient with echinococcosis alveolaris of the liver, similar to the bovine form. The infestation is explained by importation of cows from a country where the disease is endemic.

Minerals of Blood in Osteomalacia.—Blum, Delaville and Van Caulaert examined the mineral composition of the blood in a case of osteomalacia. The amount of alkali, sodium, calcium and chlorin was decreased. The content of magnesium and phosphorus was normal. The decrease of alkali was due not to an excess of acids, but to a hypo-alkalosis. A considerable lowering of sodium and calcium was not influenced by minerals in the food. It was a sign of mineral instability of the plasma.

Pituitary Extracts and Coagulation.—La Barre tried the effect of the extracts of the anterior and posterior lobes of the pituitary on coagulation in vitro. The extract of the posterior lobe did not produce coagulation, but seemed to accelerate it, through a more active formation of thrombin and fibrin. The extract of the anterior lobe markedly delayed coagulation. The delay did not occur if the extract was prepared with ether.

Absorption of Amniotic Fluid by the Embryo.—Vrbitch's research authorizes the conclusion that the embryo of fowls starts to swallow the amniotic fluid in the middle of embryonal life, and swallows more the older it is. Cells of epidermis and hair were found also in the intestine of a rabbit fetus. It may be presumed that the fluid, which is absorbed regularly in large amounts, exerts some function.

Action of Roentgen Rays on Embryos.—Ancel and Vintemberger found that a weak dose of roentgen rays retarded the development of hens' eggs. The same dose did not change, or it delayed the development of frogs' eggs. The delay was the more pronounced the larger the dose of the rays. No acceleration was observed.

Action of Irradiation on Epistaxis.—Canuyt and Wolf treated essential hemorrhages, such as nosebleed, occurring mostly in young subjects, by irradiations of different regions (hand, leg, face), always avoiding the viscera. An arrest of hemorrhage was obtained after one, two or three exposures, often after one hour of irradiation. In one case with daily hemorrhages during three years, the hemorrhages have not reappeared during the three months since. A patient with a continuous hemorrhage for eight days was cured after one exposure The treatment has been without results only in two cases.

Liége Medical

17: 873-896 (Aug. 3) 1924

*The Stimulus for the Respiratory Center. L. Dautrebande.—p. 873.
Retroversion of Pregnant Uterus. Brouha.—p. 883.

The p_H of the Respiratory Center.—Dautrebande concludes his review of the present status of our knowledge as to the factors that stimulate the respiratory center with the remark that to date there is nothing known which conflicts with the assumption that the hydrogen ion concentration of the center —not of the arterial blood—is the normal stimulus for this center.

Nourrisson, Paris

21: 217-288 (July) 1924

Tuberculosis of Bronchial Glands. A. B. Marfan.—p. 217.
*Anaphylaxis in Infants to Cow's Milk. Salès and Verdier.—p. 242.
Ritter's Disease. P. Woringer.—p. 266.

Anaphylaxis to Milk in Infants.—Salès and Verdier emphasize that the differential diagnosis between anaphylaxis and a mere intolerance for cow's milk can be made only by transmission of passive anaphylaxis to the guinea-pig. The treatment consists in desensitization, starting with two drops at a feeding, or the amount tolerated, and progressively increasing until the normal ration is reached.

Presse Médicale, Paris

32: 665-672 (Aug. 9) 1924

*Epidemic Poliomyelitis. Ducamp et al.—p. 665.
Splint for Abduction of Arm. R. Bonneau.—p. 666.
*Hemispasms of Face. L. Levi.—p. 667.
Sodium Nitrite in Injections. L. Cheinisse.—p. 671.

Epidemic Poliomyelitis.—Ducamp, Gueit and Didry point out that the different forms of pains, accompanied by fever, in acute anterior poliomyelitis depend on the section of the cerebrospinal axis in which the virus is localized. Transient pains, disappearing as paralysis occurs, are signs of an affection in the posterior horns. Persistent pains, coexisting with paralysis, are rarely generalized, and are due to disturbances in the sensory nerves (meningitis with tendency to chronicity). Persistent pains, localized in certain nerve trunks, are produced by motor and sensory neuronitis, similar to an infectious neuritis.

Hemispasms of Face.—Levi's conclusion, based on four observations, is that facial spasm of peripheral origin, not associated with contracture of the muscles, corresponds to

facial paralysis. It is due to irritation of the nerve, and is curable. The spasm combined with contracture of the muscles, primary or secondary to facial paralysis, is incurable. The facial contracture is a pure sympathetic muscular syndrome, free from skin and vasomotor manifestations. The contracture is caused by hypertonicity of the sarcoplasm of the mimetic muscles from irritation of the sympathetic fibers accompanying them. Electrolysis might be tried in treatment.

Revue de Chirurgie, Paris

68: 443-506, 1924

Pedunculated Sarcoma of Small Intestine. Vautrin and Michon.—p. 443.
Why Some Stumps Are "Bad." F. Duguet.—p. 454.
*Periarterial Sympathectomy. J. Jiano.—p. 482.
*Congenital Luxation of Hip Joint. R. Ducroquet.—p. 496.

Periarterial Sympathectomy.—Jiano reports from Bucharest thirty cases in which Leriche's operation was applied. With dry gangrene, the irritation maintains a spasm in the collaterals and terminal ramifications below, the action of the spasm thus superposed on the mechanical obstacle. The resection of 10 or 15 cm. of the periarterial sheath of sympathetic fibers arrests this spasm. In destructive syphilitic lesions, the inadequate blood supply to the region prevents the specific drugs from reaching the tissues. The periarterial sympathectomy on the trunk nerve induces peripheral vasodilatation below. This allows freer access of blood, and has proved a valuable aid not only in torpid syphilitic lesions of the extremities but also in lesions of the central nervous system, refractory to drug treatment. In one case, bilateral tabetic trophic lesions healed and lightning pains became attenuated after sympathectomy of both femoral arteries in the triangle of Scarpa. The only failures were in a case of a tuberculous process in the knee and one of pelvic neuralgia; no effect was apparent. He always uses a pedunculated flap of fascia to form a muff around the artery over the denuded region. He also always leaves a suture thread passed beneath the artery above, to serve as a ligature in any emergency.

Spontaneous Correction of Congenital Luxation of Hip Joint.—Ducroquet gives roentgenograms of several of the eleven cases on record in which the clinical symptoms of congenital dislocation of the hip joint were confirmed by radiography but under expectant treatment the luxation subsided. Ducroquet adds two personally observed cases to the list, girls aged 20 and 21 months, the congenital dislocation bilateral in one. In this case the dislocation recurred after operative treatment and use of a cast. A second operation was contemplated, but radiography four weeks later showed improvement, and in another year absolutely normal conditions. The correction occurred gradually in all these cases, between the fifteenth and thirtieth month of life, and was traced with the roentgen rays. He queries whether systematic roentgen-ray examination of young children might not show that such spontaneous cures are common. They may justify expectant treatment until a little later than is generally advised for intervention.

Schweizerische medizinische Wochenschrift, Basel

54: 713-740 (Aug. 5) 1924. Dedicated to International Conference on Tuberculosis

*The Fight of the Organism Against Tuberculosis. H. Sahli.—p. 713.
*Virulence of Tubercle Bacilli. W. Silberschmidt.—p. 721.
*Lupus Erythematodes and Tuberculosis. Bloch and Ramel.—p. 723.
Tuberculosis and Liability. R. Zollikofer.—p. 726.
Results of Sanatorium Treatment. W. Knoll and O. Deppeler.—p. 732.

The Fight of the Organism Against Tuberculosis.—Sahli reviews the various ways in which the human organism combats tuberculous infection. He believes that chemotaxis consists in attraction of the leukocytes by the products of destruction of tissues—not by the noxious agents themselves. Exudates neutralize the toxins. He recommends his subepidermal tuberculin treatment with Beraneck's tuberculin as the best available.

Virulence of Tubercle Bacilli.—Silberschmidt found a constant virulence in a long series of guinea-pigs in a strain which had killed a girl, aged 6, within six weeks. The strain produced also tuberculosis in rats and mice, especially with intravenous injections of larger doses.

Lupus Erythematodes and Tuberculosis.—Bloch and Ramel produced tuberculosis in guinea-pigs, with injections of the blood from a patient with an acute lupus erythematodes. No bacilli were found in the affected skin. They believe that the process is conditioned by a biologic modification of the virus in the skin of such patients, and they point out certain analogies with tuberculosis of rats.

Archivio Italiano di Chirurgia, Bologna

9: 469-576 (July) 1924

Diverticula in Pharynx and Esophagus. B. Anglesio.—p. 469.
Hernia of the Lung. F. Satta.—p. 509.
*Rotation of Stomach. M. Selmi.—p. 519.
Adenofibromyxoma of the Mamma. L. Durante.—p. 526.
Malformation of Bile Ducts with Lithiasis. Giuliani.—p. 537.
*Dilatation of Stomach Secondary to Nephropexy. F. Stoccada.—p. 550.
Incarcerated Retrograde Double Hernia. S. Lussana.—p. 563.

Rotation of Stomach.—Selmi presents evidence to prove that the stomach filling with food enlarges without any tendency to the traditional passive rotation.

Acute Dilatation of the Stomach Secondary to Nephropexy.—Stoccada has collected five cases in which the acute dilatation developed secondary to nephrectomy, once after nephrotomy, and twice after nephropexy. The two latter cases proved fatal, but he adds a third case to this group, with recovery. There was no stiffening of the abdominal wall, no pain and no fever, which excluded acute peritonitis, suggested otherwise by the alarming clinical picture, and volvulus could also be excluded. He thinks that many deaths ascribed to the vicious circle after gastro-enterostomy are in reality fatalities from acute dilatation of the stomach; this was revealed by the necropsy in one of his own cases. Torraca's experiments on animals demonstrated pronounced cytologic changes in the nerve plexuses of the digestive tract after trauma or inflammatory processes or changes in the blood supply. Stoccada ascribes to the toxic action of the ether the acute atony in his case, as an unusual amount had been given on account of vomiting during the operation. The stomach was rinsed out several times, the patient placed in the knee-elbow position for several hours, with brief intermissions. Relief was immediate, especially of the heart and respiratory symptoms, and in two days recovery was complete.

Pediatria, Naples

32: 881-944 (Aug. 1) 1924

Tuberculosis in Infants. C. Cattaneo.—p. 881.
*Germ of Measles. M. B. Sindoni.—p. 888.
Preleukemia in Children. A. de Capite.—p. 897.
Generalized Desquamative Erythrodermia. G. Belloni.—p. 907.
Isohemolysis in Mother and Child. Rapisardi and Pollitzer.—p. 916.
Leukanemia. G. Artusi.—p. 918.

Germ of Measles.—Sindoni confirms the presence of Caronia's micro-organism in blood, nasopharyngeal mucus, cerebrospinal fluid, urine, scales and bone-marrow in measles. Controls were negative. The germ is a gram-negative coccus of from 0.3 to 0.4 micron in diameter. The virus is filtrable. She admits that only a few visible forms develop in the cultures.

Policlinico, Rome

31: 345-400 (July 15) 1924. Surgical Section

Peptic Jejunal Ulcer. S. Gussio.—p. 345. Cont'd.
*Reinfusion of Extravasated Blood. C. Rossi.—p. 358.
*Obliteration of Mesenteric Vessels. L. Torchiana.—p. 383.
Cineplastic Amputations in Argentina. Bosch Arana.—p. 397.

Reinfusion of Extravasated Blood.—Rossi induced in fifteen dogs conditions like those in man after internal hemorrhage and reinfusion of the blood. One of the dogs developed symptoms of toxic action and died, and a second dog displayed similar symptoms but recovered. The changes in the extravasated blood in the peritoneum were found amply sufficient to explain the toxic phenomena. The microscope can be depended on to reveal whether the extravasated blood has lost its vitality and, if so, is unsuitable for reinfusion. The physical and chemical changes in the blood he does not regard as so important as the shape and size and color of the erythrocytes, showing that they are still functionally capable, regardless of the interval that has elapsed since the extravasation. His research corroborates the extremely

favorable influence of the reinfusion when conditions are propitious for it.

Obliteration of Mesenteric Vessels. — Torchiana's patient was a man of 56 who died seven days after the first symptoms. There was no vomiting, diarrhea, hypothermia or shock until the last few hours. The severe paroxysms of pain had started first in the left hypochondrium but had soon spread throughout the abdomen. Necropsy first explained the case as infarction of the bowel without the usual symptoms.

Riforma Medica, Naples

40: 697-720 (July 28) 1924

Tuberculous Pneumonia of Upper Lobe. G. Castelli.—p. 697.
*Nonspecific Agglutination. A. D'Istria.—p. 700.
Ozone and Its Applications in Hygiene. G. Graziadei.—p. 701.
Specialized Research Institutes. E. Maragliano.—p. 714.

Nonspecific Agglutination. — Istria produced by injections of glucose in some rabbits a low agglutination titer against typhoid bacilli. The agglutinins disappeared in a few days. Other injections failed to have any similar effect—contrary to the findings of other authors.

40: 721-744 (Aug. 4) 1924

Malformations of Kidneys. A. G. Chiarella.—p. 721.
*Spasmodic Laughing and Weeping. M. Battain.—p. 722.
*Serotherapy of Typhoid. L. Pistocchi.—p. 726.
*Case of Hemophilia. C. Secco.—p. 727.
Asthma from Streptococci. G. Venturelli.—p. 729.
Swine Erysipelas in Man. Gioseffi.—p. 731.

Spasmodic Laughing and Weeping.—Battain discusses the changes in the putamen in persons suffering from attacks of involuntary laughter or weeping. Unilateral lesions are sufficient to produce the phenomenon. Interruption of inhibitory pathways from the cortex cause it, as well as direct irritation of the center.

Serotherapy of Typhoid.—Pistocchi had good results with Minerbi's injections of a mixture of antiserums (typhoid, pneumococcus, streptococcus and staphylococcus), if used in the first two weeks of typhoid fever. The added serums are intended to prevent complications.

Case of Hemophilia. — Secco describes a chronic hemorrhagic condition in a woman 32 years of age. She suffered from grave epistaxis when 7 years old, and large ecchymoses since the age of 16. The coagulation time was normal during the hemorrhagic phases and prolonged between them. Addition of thrombokinase or of glass powder shortened the time of coagulation. The morphology of the blood was normal.

Anales de la Facultad de Medicina, Montevideo

9: 373-478, 1924

*Dilatation of Left Auricle. J. Montes Pareja and P. A. Barcia.—p. 373.
*Radium Therapy in North America. E. Pouey.—p. 402.
Scirrhous Cancer of Breast with Tuberculous Gland. Lamas.—p. 439.
Calcium in Blood Serum in Tuberculosis. A. Prunell.—p. 443.
Case of Actinomycosis of Right Iliac Fossa. Clivio Nario.—p. 453.

Dilatation of Left Auricle. — Montes Pareja and Barcia report the case of a man aged 35 who complained of pains in the right side of the chest, frequent dizziness and dyspnea. Twenty-two illustrations and tracings show the data on which they based the diagnosis of aneurysm of the left auricle, protruding far on the right side, and confirmed by the course of the case.

Radium Treatment in North America.—This is the first half of Pouey's official report on his mission to study radium therapy in America and Europe.

Revista de la Asoc. Méd. Argentina, Buenos Aires

37: 1-54 Internal Medicine (June) 1924

*Surgical Treatment of Angina Pectoris. J. Diez.—p. 5.
Diagnostic Intratracheal Injection of Iodized Oil. Castex et al. —p. 34.
Duodenal Tube in Diagnosis. Arrillaga et al.—p. 41.

Surgical Treatment of Angina Pectoris.—Diez operated by Jonnesco's technic in three cases, and relates that not only the paroxysms of pain but also the suffocative attacks and the erethism of the heart disappeared after the operation, and the functioning of the myocardium keeps progressively improving. He thinks that the method of Coffey and King Brown resects only the elements which are of minor importance in the transmission of the pains, sparing the really essential elements. After the operation, his three patients displayed intense hyperesthesia in the skin of the region; it kept increasing for a month but then gradually disappeared by the third month. His first patient was a man aged 43 who had been having angina pectoris for eleven years. The number and duration of the attacks had been constantly increasing until he was having three a day. Since the operation he has had no pains and no tendency to dyspnea or cardiac erethism even after an eleven mile walk. The third case teaches that severe heart or valvular disease reduces the benefit attainable by the operation.

37: 1-21 Urology (June) 1924

*Syphilis of the Bladder. C. A. and E. Castaño.—p. 5.
Acute Retention of Urine from Calculus in Ureter. Salleras.—p. 17.
Urethrobalanoposthitic Fistula. G. Vilar.—p. 20.

Syphilis of the Bladder.—The Castaños analyze a typical case in a woman aged 33. The diagnosis was based on the pains and occasional hematuria, the ulcerative, papillomatous form of the cystitis with comparatively normal urine and the the slight impairment of the general health in comparison to the bladder findings.

Revista Médica del Uruguay, Montevideo

27: 97-144, 1924

*Negro Sign in Facial Diplegia. P. Seremini.—p. 97.
*Auto-agglutination. E. Claveaux and Pérez Sánchez.—p. 108.
Exophthalmic Goiter in Diabetes. C. Bardoni Pesse.—p. 118.
Primary Erysipelas of Tongue. Montes Pareja and H. Reta.—p. 128.
*Parotitis in Pneumonia. V. Zerbino and A. Battione.—p. 137.

The Negro Sign in Facial Paralysis.—The peripheral facial diplegia had developed soon after preventive vaccine treatment of hydrophobia. As the eyeballs were turned upward, the excursion was exaggerated (Negro sign) on the side affected first and most severely by the paralysis.

Auto-Agglutination in Pneumonia.—The young woman was apparently convalescing normally from a moderate attack of pneumonia when symptoms developed explained by the discovery that the erythrocytes were clumped so tightly that it was impossible to count them, and the hemoglobin percentage was very low. The serum agglutinated the blood corpuscles at 1:10 but did not agglutinate corpuscles from other persons, and the woman's corpuscles were not agglutinated by other serums. There was no autohemolysis. The patient had been given several injections of her own blood during the pneumonia, but an interval of eight days had elapsed after the crisis and the last injection of own blood before the symptoms of intense anemia became apparent, with inversion of the leukocyte formula, leukopenia, and slight fever, but final recovery.

Parotitis in Pneumonia.—The parotitis developed with stormy onset the sixth day of pneumonia in a boy. The pneumococcus was responsible for both and the course was mild.

Deutsches Archiv für klinische Medizin, Leipzig

144: 321-378 (July) 1924

Arsenic Treatment of Pernicious Anemia. A. Engelhard.—p. 321.
*Temperature in Pernicious Anemia. H. Lehmann.—p. 327.
*Blood Metabolism in Hemochromatosis. G. Kühl.—p. 331.
*Liver Dulness in the Back. C. Cianci.—p. 339.
*Acute Lymphatic Leukemia. H. Ullmann and H. Weiss.—p. 344.
*Nephrogenous Hypertrophy of Heart. E. Kirsch.—p. 351.
*Treatment of Syphilitic Aortitis. G. Wedtke.—p. 357.
Traumatic Cancer of Left Lung. Aufrecht.—p. 371.

The Temperature and Hemoglobin in Pernicious Anemia.—Lehmann found a parallelism between the decrease of subfebrile temperature and the increase of hemoglobin in pernicious anemia. If the temperature persisted above normal, not much remission was evident.

Blood Metabolism in Hemochromatosis.—Kühl determined in a patient with bronze diabetes the urobilin in the urine and feces. It was much increased at times. The erythrocytes showed signs of regeneration during these periods. There was at times a decrease in blood platelets. Leukopenia with relative lymphocytosis was another unexplained feature of the case. No hematoporphyrin was found in the urine.

Liver Dulness in the Back.—Cianci confirms Grocco's observation on the absolute liver dulness extending from 3 to 5 cm. to the left of the spine. He found in Banti's disease, typhoid, septicemia, cholangeitis and in malaria above this absolute dulness an area of relative dulness. The latter was absent with enlargement of the liver of other origin.

Acute Lymphatic Leukemia.—Ullmann and Weiss observed the whole hematologic development of an acute lymphatic leukemia in a boy operated on for influenza otitis. The blood findings suggested pernicious anemia at first.

Nephrogenous Hypertrophy of Heart.—Kirch measured the inner walls of the heart and weighed its parts in nephritis. He found an isolated hypertrophy of the left ventricle in uncomplicated cases. The left auricle and the right ventricle become hypertrophied only secondarily after weakening of the left ventricle.

Treatment of Syphilitic Aortitis.—Wodtke advocates combined neo-arsphenamin treatment of syphilitic aortitis. The treatment should be undertaken as early as possible. The possibility of syphilis should be taken into consideration whenever any of the symptoms of aortitis are found. Syphilitics should always be reexamined for aortitis.

Deutsche medizinische Wochenschrift, Leipzig

50: 1039-1070 (Aug. 1) 1924

Changes of Position of Uterus. Stoeckel.—p. 1039.
*Ovaries and Endocrine System. L. Fraenkel.—p. 1041. Begun, p. 1007.
*Titration of Dysentery Antiserum. F. Neufeld.—p. 1043.
Disinfection of Surgical Instruments. M. Kirschner.—p. 1044.
*Action of Epinephrin in Man. E. Hassencamp.—p. 1044.
*The Cerebrospinal Fluid. M. Flockenhaus and F. Fonseca.—p. 1045.
*Sedimentation Test and Hemoclasis. B. Engelmann.—p. 1046.
Noncontagious Pulmonary Tuberculosis. H. Braeuning.—p. 1048.
*Specific Cancer Poison. R. Seyderhelm and W. Lampe.—p. 1050.
*Metabolism of Cancer. Tadenuma et al.—p. 1051.
*Experimental Cancroid of Uterus. Teutschlaender.—p. 1051.
*Pneumogastric Reflexes. S. Weissenberg.—p. 1056.
*Toxicosis of Infants. E. Schiff.—p. 1056.
The Necessary Number of Children. K. Freudenberg.—p. 1058.

Ovaries and Endocrine System.—Fraenkel found that extirpation of corpora lutea in rabbits up to fourteenth day of gravidity is followed by an abortion. If it is done later, the embryos develope normally and the uteri atrophy only afterwards. The ovaries suffer in all affections of the other endocrine organs, regardless of whether the function of the latter is increased or decreased. Fraenkel examined women inmates of insane asylums. He found there more cases of grave hypoplasia of the sex organs than in his purely gynecologic practice. It was most pronounced in schizophrenia, less in epilepsy and imbecility, and never in other diseases. The ovary of the nonpregnant woman inhibits moderately all the other endocrine organs. In pregnancy, the ovary is aided by the other endocrines. He points to this lack of *do ut des.* "All for one and the one against all."

Titration of Dysentery Antiserum.—Neufeld publishes Papamarku's results on testing antidysentery serum with emulsions of agar cultures. The action was quite different as living or killed cultures were used. Some serums had a marked antiinfectious action with a low antitoxic, and vice versa.

Action of Epinephrin in Man.—Hassencamp found an inhibition of diuresis after slow intravenous injections of 0.25 mg. of epinephrin. This was also marked, together with an increase in blood pressure, in patients with "red" or "white" hypertension.

Diagnosis from Cerebrospinal Fluid.—Flockenhaus and Fonseca consider Pandy's and the colloidal gold reaction as sufficient for the great majority of samples of cerebrospinal fluid. The sediment should be examined especially to exclude admixture of blood. The Wassermann reaction is useful for exclusion of multiple sclerosis. Two such patients with rapidly progressing symptoms gave a paralysis curve.

Sedimentation Test and Hemoclasis.—Engelmann finds the sedimentation test after milk ingestion of no use for diagnosis of hemoclasis or of an affection of the liver.

Specific Cancer Poison.—Seyderhelm and Lampe extracted fresh human cancer tissue with alcohol. Only the extracts obtained at —17 C. were toxic. It seems that the poison is destroyed at room temperature by the ferments of the cancer.

Metabolism of Cancer.—Tadenuma, Hotta and Homma found in fowls a lower blood sugar in the vein of a wing with a sarcoma than in the other wing. Glycolysis was also much stronger in the former blood. They point out that the presence of a substance resembling insulin is probable. The tumor blood contains less amylase than the blood from the healthy wing.

Experimental Cancroid of Uterus.—Teutschlaender injected tar into the vaginas of seven rats. The substance reached into the uteri and induced, in four of them, the formation of a squamous epithelium in the horns of the organ. In one of them a cancroid penetrating through the wall was found 242 days after the first injection. This formation of cancer from a squamous epithelium instead of from the original cylindric epithelium indicates that the impulse acted probably on the basal cells of the new epithelium in statu nascendi.

Pneumogastric Reflexes.—Weissenberg frequently observed earache in pharyngitis. He believes that this is due to a pneumogastric reflex. He suffers from premature heart contractions. Every stop in the heart action produces a cough in him. The cardiac troubles with distended stomach and vomiting in gallbladder and kidney colics are also instances of vagus reflexes. Gatcher has noticed in apical infection earache on the same side.

Toxicosis of Infants.—Schiff believes in a disturbance of the liver in toxicosis of infants. He attributes it to a change of the intermediary protein metabolism, due to acute dehydration.

Deutsche Zeitschrift für Chirurgie, Leipzig

186: 145-288 (July) 1924

*Diagnosis of Duodenal Ulcer. A. Beck.—p. 145.
Imperfectly Obliterated Omphalomesenteric Duct. Löhr.—p. 156.
*Nature of Heart Beat. E. K. Frey.—p. 168.
Acute Osteomyelitis of Hip Joint. Portwich.—p. 236.
*Presarcoma Processes. A. Beck.—p. 255.
*Fat Embolism from Humanol. H. Koch.—p. 273.
Retroperitoneal Perforation of Gallbladder. L. Sussig.—p. 279.
Volvulus with Malformation of Intestine. K. Braeunig.—p. 284.

Diagnosis of Duodenal Ulcer.—Beck found nothing to explain the clinical picture of duodenal ulcer in 2 of the 52 cases in which he operated on this diagnosis. All but 9 per cent. were men, aged 18 to 75. Tests for occult blood were sometimes negative with a florid ulcer, and vice versa. The gastric chemistry was normal in about half the cases. The roentgen-ray findings may vary at different times, and their testimony for or against an ulcer is not absolutely dependable. A filling defect in the upper duodenum was found by Lorenz in 3 of 167 cases; Akerlund, 66 in 106; Beck, 3 in 46, and the duodenum was hidden behind the stomach in 5 per cent. of Chaoul's cases. Symptoms of gastritis in the antrum are presumptive evidence of a duodenal ulcer, especially when the duodenum and not the stomach wall is tender on pressure. Adhesions from gallstones pulled the duodenum out of shape in two cases and led to the mistaken diagnosis of a duodenal ulcer.

Nature of Heart Beat.—Frey relates that the heart continued to beat regularly and vigorously after the heart muscle had been thoroughly impregnated with different poisons which arrest the action of nerves and ganglions. He accepts this as direct proof of the myogenous origin of the cardiac impulse. Infiltration of the walls of the heart with drugs which have a specific action on the functioning of the heart was not followed by the characteristic phenomena on the part of the heart. The research with strophanthin made it probable that in the action of every poison and toxin nervous influences are a very important factor, as we know is the case in inflammation. In rabbits, intravenous injection of strophanthin produces much less of an effect after both vagi have been severed. The typical reaction of the dog heart to intracardiac or intravenous injection of strophanthin does not occur when the innervation of the heart has been blocked with procain, even when otherwise lethal doses of strophanthin are injected. One dog injected intravenously with 0.25

mg. of strophanthin per kilogram—after the heart nerves had been blocked with 6 c.c. of a 2 per cent. solution of procain—had a normally regular heart beat during the hours afterward and seemed fresh and vigorous, speedily recuperating. This dog succumbed to pleurisy five days later.

Presarcoma Lesions.—Beck describes two cases of a persisting focus of old osteomyelitis with torpid fistulas in a man and a woman, aged 35 and 46, in which the regenerating tissues showed sarcomatous degeneration. This sustains the possibility of a traumatic origin for sarcoma.

Fat Embolism from Injection of Oil.—Koch knows of only one published case of fat embolism from injection of olive oil. He here reports an instance of severe pulmonary and cerebral fat embolism after injection of 24 gm. of tried out human fat (Humanol). The young man recovered. The injection had been made in the neck, for cosmetic purposes, in a healed glandular focus.

Jahrbuch für Kinderheilkunde, Berlin

100: 177-262 (July) 1924

*Value of Fat Determination in Human Milk. H. Koeppe.—p. 177.
Therapeutic Value of Suggestion in Pertussis. Zanker.—p. 195.
*Trypanocidal Substance in Blood. Grünmandel and Leichtentritt. —p. 203 and p. 215.
*Researches on Lipase and Diastase in Children. Hizume.—p. 227.
Congenital Stenosis of Small Intestine in Infant. Hueter.—p. 245.

Clinical Value of Determination of Fat Content of Human Milk.—Koeppe emphasizes that it is not always sufficient to measure the quantity of milk a child secures. There is a vast difference whether it is getting milk containing from 3 to 4 per cent. butter fat, or whether the milk he drinks contains twice that percentage—from 6 to 8 or (as occurs occasionally) 10 per cent. butter fat, since it is the butter fat mainly that yields the energy quotient or the required number of calories. Often an infant that takes the first three fourths of the milk, in the breast that is weaker in butter fat, refuses to take the last fourth, that is much richer in butter fat, because in quantity it has taken all the liquid it can stand. It begins to thrive when the first fourth is pumped out of the breast. The infant gets then the last three fourths that is richer in butter fat. Some mothers worry because their child is getting little more than a pint a day, in spite of the fact that the child is well and gaining in weight. A large (8 or 10 per cent.) percentage of butter fat explains.

The Trypanocidal Substance in the Blood.—Grünmandel and Leichtentritt confirm the value of the content of the trypanocidal substance in children's blood as an index of the child's defensive forces at the moment. They report research in this line in keratomalacia, edematous conditions and scurvy.

Researches on Lipase, Diastase, Etc., in Nutritional Disturbances in Children.—Hizume found the lipase within normal range in the blood serum and urine of undernourished children and in alimentary toxicosis but increased in rickets, as also in the stools. The values for diastase in the blood serum, urine and feces of normal infants are subject to considerable fluctuations; the same was true in undernourished subjects. In rickets the diastase in the urine was above normal in only two cases and in the stools in three. In infants with nephritis, the quantity of pepsin and erepsin in the urine was plainly increased.

Klinische Wochenschrift, Berlin

3: 1425-1472 (Aug. 5) 1924

*Xanthomatous Tumors. E. Kirch.—p. 1425.
*Etiology of Typhus. M. H. Kuczynski et al.—p. 1429.
*Capillary Pressure. H. Nevermann.—p. 1433.
*Technic and Biology of Roentgen Irradiation. F. Heimann.—p. 1436.
*Experimental Pernicious Anemia. R. Seyderhelm et al.—p. 1439.
*Hyperglycemia in Hypertension. S. Iwai and E. Löwy.—p. 1440.
*Fibrinogen and Platelets in Tuberculosis of Liver and Spleen. H. Opitz and M. Silberberg.—p. 1443.
Chemical Contracture of Muscle. O. Meyerhof.—p. 1445.
Chemical Contracture. O. Riesser and N. Heianzan.—p. 1446.
*Latency in Heart Muscle. F. Schellong.—p. 1447.
*Anaphylatoxin from Dry Complement. H. Dold.—p. 1448.
*Adsorption of Complement by Dyes. F. Klopstock.—p. 1448.
Treatment of Myelogenous Leukemia. Feilchenfeld and Peters.—p. 1449.
*Third Stage of Labor. T. Heynemann.—p. 1450.
Thyroid and Thermoregulation. P. Schenk.—p. 1454. Cenc'n, p. 1502.

Xanthomatous Tumors.—Kirch describes various neoplasms with accidental xanthomatous changes due to deposits of fat and especially esters of cholesterol in the cells. The origin of xanthomatous granulomas (in diabetes, etc.) is analogous. General hypercholesterolemia and local causes, such as stasis of lymph, concur in the etiology of the deposits.

Etiology of Typhus.—Kuczynski, Brandt and Maschbitsch report on the experiments they made in Omsk. They found the typhus less contagious and less grave than before. They cultivated the same proteus from lice containing rickettsia as they obtained from the brain of infected guinea-pigs. The cultures were negative with lice which did not contain rickettsia. They consider the problem of etiology of typhus solved in Weil's sense: *Proteus rickettsia prowazeki* is the agent.

Capillary Pressure.—Nevermann found no increase of blood pressure in the capillaries in pregnancy. It is frequently higher in toxicoses and especially eclampsia of pregnancy. The pressure in the capillaries is not parallel with the blood pressure.

Technic and Biology of Roentgen Irradiation.—Heimann returns from strong to medium doses of roentgen rays. Operable cancers should be passed to the surgeon. Subsequent irradiation after extirpation of uterine cancer gave good results.

Experimental Pernicious Anemia.—Seyderhelm, Lehmann and Wichels produced in dogs a stricture of the ileum about 5 or 10 c.c. from the ileocecal valve. Most of the dogs survived without signs of anemia. Bacteriologic examination showed that the ileum was practically as sterile in these animals as it is in normal dogs. Two of them developed within two weeks a hyperchromic anemia with megalocytes. They died within ten weeks. The ileum contained the same flora as the colon, a condition similar to that found in patients with pernicious anemia.

Hyperglycemia in Hypertension.—Iwai and Löwy found in pure hypertension a normal glycemia and normal alimentary reaction to 20 gm. of sugar. Only the azotemic patients had increased blood sugar and a diabetic alimentary curve.

Fibrinogen and Platelets in Tuberculosis of Liver and Spleen.—Opitz and Silberberg describe the history of a child, 2½ years of age, with jaundice, petechiae and edema. The blood aspirated from the heart ten minutes after death contained no fibrinogen and few platelets. Necropsy revealed tuberculosis of the lungs, spleen and especially of the liver.

Latency in Heart Muscle.—Schellong found an extremely short period, if any, of latency of the electric response to stimuli, of strips of heart muscle. The response to natural stimuli was stronger than to artificial "threshold" stimuli. The research was aided by a Rockefeller Foundation grant.

Anaphylatoxin from Dry Complement.—Dold was able to produce anaphylatoxin when using solutions of dried serum from guinea-pigs after incubation with prodigiosus bacilli. The symptoms were less grave than with fresh serum.

Adsorption of Complement by Dyes.—Klopstock obtained adsorption of complement in a 0.1 per cent. solution of night-blue and in 0.05 per cent. solution of Congo red. The former dye is electropositive and the latter electronegative. Mixing the dyes with lipoids, such as the Wassermann antigen, increased their potency from ten to twenty-fold. Serum counteracts this phenomenon.

Third Stage of Labor.—Heynemann recommends C. Schröder's and O. Küstner's signs of detached placenta. The former consists in the narrowing of the uterus and its rise above the navel, together with a change of its round shape to a flat one. The latter sign is the lack of retraction of the cord by pressure with the finger-tips above the symphysis. Pituitary preparations may be injected before the placenta is detached. Ergot should not be used at this stage. Moderate bleeding may stop after injection of a pituitary preparation (preferably intravenous). Stronger bleeding requires compression of the aorta—best accomplished by Haselhorst's instrument. Only the bleeding from the introitus and clitoris is not checked by it.

Medizinische Klinik, Berlin

20: 1063-1096 (Aug. 3) 1924

Science of Nutrition. E. Remy.—p. 1063.
*Radiologic Diagnosis of Gastric and Duodenal Ulcer. A. Czepa. —p. 1068.
Hemopoietic Organs in Sepsis. E. Gimplinger.—p. 1073.
Barium Preparations. C. Witthowsky.—p. 1076.
Iontophoresis in Dermatology. J. Sellei and J. Fenyö.—p. 1078.
Vaccine Treatment of Gonorrhea. Orlowski.—p. 1079.
*Serodiagnosis of Tuberculosis. W. F. Winkler and H. Gerth.—p. 1080.
Obstetrical Breviary. F. Eberhart.—p. 1082.
Milk Mixtures for Infants. W. Schmitt.—p. 1084. Cont'd.

Radiologic Diagnosis of Gastric and Duodenal Ulcer.—Czepa reviews eighty roentgenologically diagnosed cases of ulcer of the stomach or duodenum. The positive diagnosis was practically always confirmed by the surgeon.

Serodiagnosis of Active Tuberculosis.—Winkler and Gerth found that neither the Wassermann, the Bonacorsi nor the Mátéfy reaction can demonstrate whether or not a tuberculous process is active. The last mentioned method has only a questionable value, and the Bonacorsi was positive indiscriminately in health and in tuberculosis. Wassermann's reaction was never positive in health, but was negative in 25 per cent. of the tuberculous patients. It sometimes became positive on the day following a tuberculin injection.

Monatsschrift für Geb. und Gynäkologie, Berlin

60: 327-398 (July) 1924

*Harelip and Polydactylism. F. C. Lücker.—p. 327.
*Icterus Neonatorum. K. Meier.—p. 337.
Polycystic Tumor of Broad Ligament. W. Nissen.—p. 339.
Carcinoma of Both Ovary and Appendix. M. Harnik.—p. 345.
Myoma of Vaginal Portion of Cervix. E. Gueissaz.—p. 351.
Standardization of American Hospitals. A. Stein.—p. 359.

Harelip and Polydactylism.—Lücker emphasizes that harelip and polydactylism are hereditary malformations, and both may occur in one family. Polydactylism is endemic in a certain secluded village in which consanguineous marriages have been frequent.

Icterus Neonatorum.—Meier points out that an increased hemolysis is not the only factor in jaundice of the new-born. An insufficient development of the liver shares in the pathogenesis.

Monatsschrift für Kinderheilkunde, Berlin

28: 289-384 (July) 1924

Toxicosis in Infants. S. Rosenbaum.—p. 289.
*Symptoms of Tetany Following Diphtheria. K. Ochsenius.—p. 323.
*Bothriocephalus Anemia in Children. S. Grünmandel.—p. 325.
*Bacteriophage in Stools of New-Born. Surányi and Kramár.—p. 330.
*Pneumococcus Peritonitis in Dropsy. B. Schönfeldt.—p. 334.
Tuberculous Meningitis in Mongoloid Idiot. Meseck.—p. 343.
Paratyphoid in Infants. A. Mendelssohn.—p. 348.
"The Prevalence of Tuberculosis." F. Hamburger.—p. 355.

Tetany in Diphtheria.—Ochsenius witnessed the development of spasmophilia, with laryngospasm, in two infants aged 11 and 15 months, a week or ten days after subsidence of diphtheria under antitoxin treatment. No paralysis was noted in either case.

Bothriocephalus Anemia in Children.—The anemia was of the pernicious type in the girl of 11, and hemolysis followed a large transfusion of blood. Then small amounts of blood from another donor were given daily for five days—a total of 350 c.c.—which improved the general condition to such an extent that treatment for the bothriocephalus could be applied, with prompt recovery.

Bacteriophage in Stools of the New-Born.—There were no signs of lytic action in meconium. Four days was the earliest age at which bacteriophage action was manifest.

Pneumococcus Peritonitis.—Schönfeldt calls attention to the stormy onset and rapidly fatal course of pneumococcus peritonitis in three children with severe dropsy, in contrast to the usual benign course in children free from dropsy. Comparison of these cases shows marked retention of sodium chlorid as a common factor, and he queries whether the retained sodium chlorid has an influence on the proliferation of the pneumococcus.

Wiener klinische Wochenschrift, Vienna

37: 771-792 (Aug. 7) 1924

Body Proteins in Diseases. W. Berger.—p. 771. Cont'd.
*Early Diagnosis of Gastric Cancer. E. Schütz.—p. 775.
*Diverticula of the Duodenum. M. Haudek.—p. 776.
*Swallowing. J. Flesch.—p. 779.
Liver Atrophy and Dermatitis After Arsphenamin. A. Kirch.—p. 781.
*"Surgery of Gastric Ulcer." H. Schur.—p. 782.
*Action of Iodin and Thymus on Respiratory Metabolism. P. Liebesny. —p. 783. Conc'n.
Heliotherapy in Austria. A. Kutschera-Aichbergen.—p. 785.
Procain in Surgery. F. Mandl. Supplement, pp. 1-16.

Early Diagnosis of Gastric Ulcer.—Schütz advises a complete examination of every patient with stomach disturbances of more than two weeks' duration. Anacidity with the presence of numerous short bacilli makes cancer probable.

Diverticula of the Duodenum.—Haudek describes the history and roentgenologic findings in a woman with diverticula of the duodenum. The symptoms resembled chronic ileus.

Physiology and Pathology of Swallowing.—Flesch discusses the physiology and pathology of swallowing. In affections of the tonsils, the "empty" swallowing is most painful because the muscles of the tongue, palate and pharynx have to contract more in order to separate the oral from the pharyngeal cavity. Such patients have little discomfort if they fill the mouth with as much fluid (about 8 oz.) as it can hold. Then the head is bent slowly backward which causes occlusion of the larynx by the base of the tongue. After this, the whole of the fluid is swallowed at once without much pain. In other cases and in bulbar affections the nose may be used for feeding: Milk, and even semifluid foods, passed through a fine sieve, may be poured into the nostril in amounts of about 5 c.c., if the patient is lying on his back with slightly elevated head. The food has to be lukewarm, and it is well, after feeding, to cleanse the nose with a few spoonfuls of a 1 per cent. solution of sodium bicarbonate.

"Surgery of Gastric Ulcer."—Priority claim of Schur and Plaschke in principle of Finsterer's method.

Action of Iodin and Thymus on Respiratory Metabolism.—Liebesny combines small doses of potassium iodid (from 1¼ to 3 mg., daily) with ingestion of thymus gland, preferably from young animals. He had good results in hyperthyroidism. The iodin was much better tolerated.

Zeitschrift für klinische Medizin, Berlin

100: 363-654 (July 25) 1924

*Oncotic Plasma Pressure and Edemas. H. Schade and Claussen. —p. 363.
*Action of Calcium and Digitalis. E. Billigheimer.—p. 411.
*Water Metabolism in Diabetes. O. Klein.—p. 458.
*Sulphur of Blood in Cancer and Tuberculosis. J. Vorschütz.—p. 478.
*Myogenic Leukocytosis. A. Egoroff.—p. 485.
Polycythemia Rubra with Leukemic Myelosis. Von Winterfeld.—p. 498.
*Blood Metabolism in Pernicious Anemia. A. Sonnenfeld.—p. 508.
*Polychromatophilia. J. Kocpman.—p. 517.
Pseudochylous Effusions. G. Grund and H. Jastrowitz.—p. 521.
*Colon Bacillus in Stomach in Pernicious Anemia. Wichels.—p. 535.
Rhodan Content of Saliva. F. Lickint.—p. 543.
Blood in Menstruation. G. Holler et al.—p. 564.
Pernicious Anemia Versus Lymphadenosis. Eisner and Mayer.—p. 582
*Action of Tuberculin on Water Metabolism. W. Pockels.—p. 595.
Jolly's Bodies in Splenectomized Dogs. J. Weickael.—p. 608.
*Diuresis After Vital Staining. L. Paunz.—p. 623.
Thrombopenia and Essential Thrombosis. G. Nagy.—p. 630.
"Test of Vegetative System." K. Csépai.—p. 648.

Oncotic Plasma Pressure and Edemas.—Schade and Claussen describe their apparatus which permits determination of the osmotic pressure (or, as they say, oncotic pressure, or Quellungsdruck) of plasma proteins within a few hours. The pressure varied around 25 mm. of mercury in normal subjects, with fluctuations up to 4 mm. each way. It was lower (down to 11 mm.) in nephritis with edema. The figures were independent of the protein concentration and viscosity. Their experiments endeavor to prove that abnormally low osmotic pressure of the plasma colloids is the cause of renal edema with its predilection for the face and hands. Cardiac edema has a normal osmotic pressure of plasma colloids. They believe that the kidney regulates it.

Action of Calcium and Digitalis.—Billigheimer found in man a close similarity between calcium and digitalis in respect to their point of action and the action itself. They

differ only in the duration of the effect. Each drug increases the action of the other.

Hormones and Water Metabolism in Diabetes After Insulin and Pituitary Extract.—Klein found that water retention in the tissues occurs in the majority of diabetics following insulin injections. The water content of the blood remains unchanged or decreases slightly except after prolonged treatment. Extract of the posterior lobe of the pituitary prevents water secretion and causes hydremia with a brief increase in chlorids. In a case of pluriglandular insufficiency, insulin acted like pituitary extract. At the same time it failed to decrease the hyperglycemia and glycosuria.

Sulphur Content of Blood in Cancer and Tuberculosis.—The percentage of total sulphur in the serum was about one-half lower than in the erythrocytes in Vorschütz's 500 tests. There were no differences between the blood from cancer and tuberculosis patients.

Myogenic Leukocytosis.—Egoroff observed an absolute and relative lymphocytosis after physical exertion. Too hard effort caused lymphopenia and neutrophilia, with appearance of younger forms. The numbers of eosinophils, basophils and of lymphocytes with azurophilic granules decreased.

Blood Metabolism in Pernicious Anemia.—Sonnenfeld's examinations of pernicious anemia patients again demonstrate the increased speed of blood destruction and the prognostic significance of the amount of urobilin in the feces.

Polychromophilia.—Koopman attributes the polychromophilia to a deficiency in lipoids. Mixtures of cholesterol and lecithin remove preexisting polychromophilia as well as the artificial, produced in any blood smear within a few days by ether or alcohol. Basophilic stippling in a case of lead poisoning remained unchanged. He concludes that it has some other origin.

Colon Bacillus in Stomach in Pernicious Anemia.—Wichels found the contents of the fasting stomach usually sterile in healthy subjects, also with ulcers, and even in achylia. Many colon bacilli were present in almost every case of pernicious anemia and of cancer of the stomach.

Action of Tuberculin on Water Metabolism.—Pockels injected intravenously various proteins in tuberculous children. This produced the same variations in hydremia as tuberculin. Subcutaneous injections of larger amounts of proteins cause blood changes in every healthy child.

Diuresis After Vital Staining.—Paunz found an inhibition of secretion of water and solid substances after injections of a vital stain (water blue).

Zeitschrift für Tuberkulose, Leipzig

40: 321-400 (July) 1924

Refractivity and Viscosity of the Blood Serum in the Tuberculous. M. Gänsslen and O. Maier.—p. 321.
Tuberculosis in Tropical Climate. M. Heinemann.—p. 324.
The Abdomen-Leg Defense Reflex. A. Bogdanow.—p. 329.
*Leukocyte Count in Tuberculosis. H. Schulte-Tigges.—p. 332.
Pure Culture of Tubercle Bacilli from Sputum. Y. Sumiyoshi.—p. 338.
*Bronchial Catarrh and Tuberculosis. A. Schneider.—p. 349.
*Measles and Tuberculosis. R. Wachter.—p. 353.

Leukocyte Count in Tuberculous Spontaneous Reaction.—Schulte-Tigges points out that about the end or after a spontaneous tuberculous reaction, an increase of eosinophils often occurs, following their decrease or disappearance during the reaction. He regards the serial leukocyte count as very instructive in tuberculosis.

Absence of Parallelism Between Catarrh and Tuberculosis.—Schneider believes that the physical findings in pulmonary tuberculosis are due to a blending of specific changes in the lungs and to nonspecific changes in the bronchial mucosa. The catarrhal signs may come and go regardless of the specific lesions. Cured lungs may manifest signs of a profuse catarrh, which does not indicate an active or nonactive tuberculosis.

Measles and Tuberculosis.—Wachter found a marked delay in sedimentation in tuberculous children for several weeks after measles, proving the inhibiting influence of the infection on immunity. The sedimentation test may thus give early warning of a menacing or beginning tuberculosis after measles.

Zeitschrift für urologische Chirurgie, Berlin

18: 227-328 (July 28) 1924

*The p_H of the Urine in Functional Tests. G. v. Pannewitz.—p. 227.
Cystic Kidneys. G. B. Gruber.—p. 246.
*Bacteriology in Urogenital Tuberculosis. E. Löwenstein.—p. 255.
*Foreign Body in Bladder. P. Janssen.—p. 260.
*Influence of Diseased Kidney on Sound Mate. Walthard.—p. 263.
Anomalies in the Kidneys. B. E. Linberg.—p. 315.
Hypoplasia of Kidney with Cystic Degeneration. Hueck.—p. 322.

Acid-Alkali Test of Kidney Function.—Pannewitz' research has confirmed the wide fluctuations in the p_H of the urine under the influence of food, drugs and of nervous and emotional stress. In applying the SUA test, it is important to eliminate fluctuations due to these causes, and this can be done by serial determination of the p_H in the bladder urine. The test is made with substances natural to the organism: 20 drops of dilute hydrochloric acid is given by the mouth. The urine reaches the peak of acidity in the healthy in fifteen or thirty minutes. Then 50 c.c. of a 4 per cent. solution of sodium bicarbonate is injected intravenously and the urine becomes alkaline, reaching the alkaline peak in ten minutes. The play of the ion metabolism thereafter is instructive for both diagnosis and prognosis.

Bacteriologic Diagnosis of Urogenital Tuberculosis.—Löwenstein noticed that 40 per cent. sulphuric acid or 35 per cent. sodium hydroxid added to five times the amount of sputum destroys all the bacteria except the tubercle bacilli, and these settle into the sediment. By this means he obtained pure cultures in 100 per cent. of his specimens, and was able to demonstrate that the tubercle bacilli discovered were nonpathogenic for guinea-pigs in two of his thirty cases. These two represented human cases of fowl tuberculosis; the clinical picture was that of mild sepsis with low morning and high evening temperature without positive physical findings in the lungs, the whole keeping up for years. The kidneys and the bone marrow are the favorite seats of the bacilli, whence they pour into the blood without causing local suppuration or bleeding. Treatment with human tuberculin is naturally futile, but an avian tuberculin might have some chance of success.

Foreign Body in Bladder.—The hard, round leather belt from a sewing machine had been worked into the bladder, and the bladder had evidently responded with such vigorous contractions that the belt was twisted into a double knot. It proved impossible to relieve the young man except by a suprapubic incision. The case teaches the danger of attempting forcible extraction when a foreign body resists gentle traction.

Influence of Diseased Kidney on Sound Mate.—Walthard induced aseptic resorption of devitalized kidney tissue in the left kidney of seventy-one rabbits, and found in all unmistakable evidence of toxic injury of the whole organism, most pronounced in the sound kidney. The indigocarmin test failed in such a large proportion of the rabbits that a different mechanism of elimination from that in man seems plausible.

Zeitschrift für Urologie, Leipzig

18: 417-464, 1924

*Cancer of Bladder in Anilin Workers. C. Posner.—p. 418.
Surgical Treatment of Strictures of Urethra. Stutzin.—p. 422.
Two Cases of Renal Hemorrhage. Siedner.—p. 425.
Urine Formation in Relation to the Blood. Armbruster.—p. 433.
Research on Urine Formation. Armbruster.—p. 439.
Neo-Arsphenamin in Pyelitis in Women. A. Matusovszky.—p. 445.
Madder in Nocturnal Enuresis. A. Bauer.—p. 452.
*Congenital Cysts in the Kidneys. G. Katz and E. Mühe.—p. 453.

Cancer of Bladder in Anilin Workers.—Posner discusses the fact that workers who deal with anilin are more than others affected with cancer of the bladder. The first symptoms may not appear until many years after abandoning the occupation. He believes that anilin not only causes hematolysis, but acts in some way directly on the bladder. Experimental research has been constantly negative, and metastasis in the bladder has never been reported with tar cancers.

Congenital Cysts of the Kidney.—Katz and Mühe, referring to two cases, say that the congenital cystic kidney can clinically hardly be differentiated from a renal tumor or renal sclerosis. The disease is hereditary, affects usually both kidneys, and the cysts are multiple. The chief symptoms are

a paroxysmal, persistent hematuria, hypertonia, and finally uremia. In one instance, in which one kidney was removed, the patient recovered, although a cerebral hemorrhage occurred eight years after the operation. The woman's blood pressure was 175 mm. of mercury at this time, but she recovered and is still in satisfactory condition two years later except for rare slight hematuria.

Zentralblatt für innere Medizin, Leipzig

45: 633-664 (Aug. 9) 1924

*Action of Insulin on Chemical Reduction. E. Becher.—p. 634.
Survey on Rhinolaryngology. O. Seifert.—p. 637.

Action of Insulin on Chemical Reduction.—Becher added six units of insulin to 1 c.c. of a 20 per cent. solution of glucose. This solution reduced 1 c.c. of gamma dinitrophenol solution after addition of 25 per cent. ammonia much quicker than the control without insulin. No living tissue was needed to produce this effect.

Casopis lekaruv ceskych, Prague

63: 1197-1224 (Aug. 9) 1924

*Theory of Kidney Function Tests. V. Laufberger.—p. 1197.
*Spina Bifida. O. E. Schulz.—p. 1203. Conc'n.
*Bacteriology of Ozena. H. Greif.—p. 1208. Conc'n.
"Drosera Rotundifolia." J. Kelousek.—p. 1215.

Theory of Kidney Function Tests.—Laufberger criticizes the theoretical foundations of the functional diagnosis of disease of the kidneys. He would prefer a complete separation of the anatomic diagnosis of gross changes of the organs, where it is feasible, from the physiologic diagnosis of general functions, as for instance, water metabolism. The latter depends not only on one organ (kidneys) but also on the other tissues. A synthesis of both view-points may come later.

Spina Bifida.—Schulz concludes his study on occult spina bifida and its relation to deformities of the lower extremity. He finds that it is a quite frequent cause.

Bacteriology of Ozena.—Greif found Perez-Hofer-Shiga's bacillus not only in genuine ozena but also in ozena of syphilitic and mechanical origin. Inoculations in rabbits produced changes which did not resemble the human affection. The serum of patients agglutinated the bacilli only in high concentrations (1:10). He concludes that the results of vaccine therapy are due to a nonspecific protein effect. Ozena is a nosologic but not an etiologic entity.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

2: 479-614 (July 26) 1924

Haldane's Carbon Dioxid Tension Apparatus in Estimation of Ventilation of School Rooms. Leopold.—p. 480.
*Irritations in Production of Cancer. H. T. Deelman.—p. 489.
Experiences with Tuberculins. B. J. van der Weij.—p. 495.
Myodiopters. G. J. Schoute.—p. 504.
*Local Treatment with Cod Liver Oil. Andreae and van Brero.—p. 511.
*Recent Research on Cerebellum. G. van Rijnberk.—p. 516.

The Cumulative Action of Cancer-Producing Irritations.—Deelman comments on the remarkable similarity of the figures representing the number of applications of tar required before the first signs of visible change in the tissues became manifest in his seven series of fifteen white mice each. The figures were 22 when the tar had been applied at intervals of two days; 18, three days; 19, four days; 17, five days and six days, and 18, seven days. The cancer-producing influence proceeded inexorably in its work even when in the long intervals the skin seemed to have recuperated completely between the tar applications, so that the area had to be shaved anew each time. With the shorter intervals, the hair never grew. The irritation inducing cancer formation is thus independent of the rhythm of application of the irritation. His research showed further that in each series, the tissue changes, once installed, assumed a malignant aspect in from fifty to sixty days—an almost constant interval notwithstanding that the total period of applications ranged from forty-four days to 140 days. It is evident, he says, that the tissue changes depend on the summation of the irritations, but also that when this cumulative effect has reached a certain point, the malignant transformation proceeds inexorably regardless of the continuance of the irritation. In human cancer, the irritation may have escaped attention or been forgotten when the physician first sees the cancer.

Cod Liver Oil in Local Treatment of Tuberculous Abscesses.—Of the thirty-one children treated in this way at a seashore sanatorium, twenty-three showed marked improvement, or the abscess or fistula healed completely. Bismuth or iodoform was combined with the cod liver oil. The eight refractory cases were all extremely grave and of years' standing.

Recent Research on the Cerebellum.—Van Rijnberk reproduces twenty-three illustrations to accompany his analysis of the works of different recent writers on structure and localization in the cerebellum.

2: 615-738 (Aug. 2) 1924

Malaria in Surinam. C. Benne.—p. 616.
*Vaccination by Mouth Against Cholera. P. Peverelli.—p. 638.
Mechanical Aids for the Deaf. H. Zwaardemaker.—p. 641.
Syphilitic Jaundice One Month After Infection. Bottema.—p. 653.
History of Incisions for Calculi. A. J. van der Weijde.—p. 655.
History of Amber in Medicine. M. A. van Andel.—p. 666.

Vaccination by the Mouth Against Cholera.—Peverelli saw no influence on normal rabbits from large amounts of living or killed cholera vibrios given through the stomach tube. But if a bile pill had been given previously, this seemed to render the digestive tract permeable and production of antibodies followed. The intestinal wall displayed a potent bactericidal action when the vaccination was thus rendered possible by the bile or the vibrios were injected by the vein. The vaccination of the rabbits was so effectual that most of them bore without harm intravenous injection of an otherwise lethal amount of vibrios. A group of seven volunteers took, fasting, a bile pill and a tablet of desiccated vibrios, and their blood showed a marked increase of antibodies thereafter, while this occurred only in one in a similar group who did not take the bile pills. He cites nine writers who have published favorable experiences with vaccination by the mouth against typhoid, dysentery or cholera.

Acta Chirurgica Scandinavica, Stockholm

57: 1-192 (July 12) 1924

Classification of Fractures of Upper Portion of Femur. R. Faltin.—p. 1.
*Treatment of Fractures of Neck of Femur. Idem.—p. 10.
*Idem. U. Lindgren.—p. 55.
*Perforation Peritonitis. L. Schönbauer.—p. 103.
Subphrenic Bile Peritonitis Without Perforation. Kallmark.—p. 169.
Extradural Spinal Abscess. A. Westerborn.—p. 182.

Fractures of the Neck of the Femur.—The three articles on fracture of the neck of the femur are in English. Faltin protests against the prevailing pessimistic conception of these fractures, saying that when a medial fracture fails to heal this is due to inadequate apposition and retention of the fragments and not to the poor blood supply. A year must be allowed for the healing. Lindgren declares that fracture of the neck of the femur requires institutional treatment, the medial fractures without exception, under repeated roentgen control. No weight should be borne on the leg for at least six months. He gives eight large tables with the particulars and outcome in 100 cases, most of them reexamined from one to five and a half years later. The outcome in another group of eleven operative cases is also reviewed. Both Faltin and Lindgren extol Whitman's abduction method as the routine procedure for recent fractures.

Perforation Peritonitis.—Schönbauer analyzes the cases and outcome at the Eiselsberg clinic in the last fourteen years. Pepsin with a digestive potency of 1:3,000 was used in making the "hydrochloric acid pepsin" with which the infected peritoneum was rinsed in several groups of cases. Necropsy in two of the thirty-two postappendicitis cases treated with the pepsin revealed almost complete healing of the diffuse peritonitis seen at the operation two or three days before. A third necropsy in a diabetic showed that the peritonitis had not been influenced at all by the biologic antiseptic. In one at least of the seven cases of peritonitis from perforation of an ulcer, the pepsin seemed to have had a life-saving influence. In another much debilitated patient with moderate glycosuria, it is possible that a less tedious operation, without rinsing, might have saved the young man who died twenty hours after resection of two thirds of the stomach and part of the duodenum.